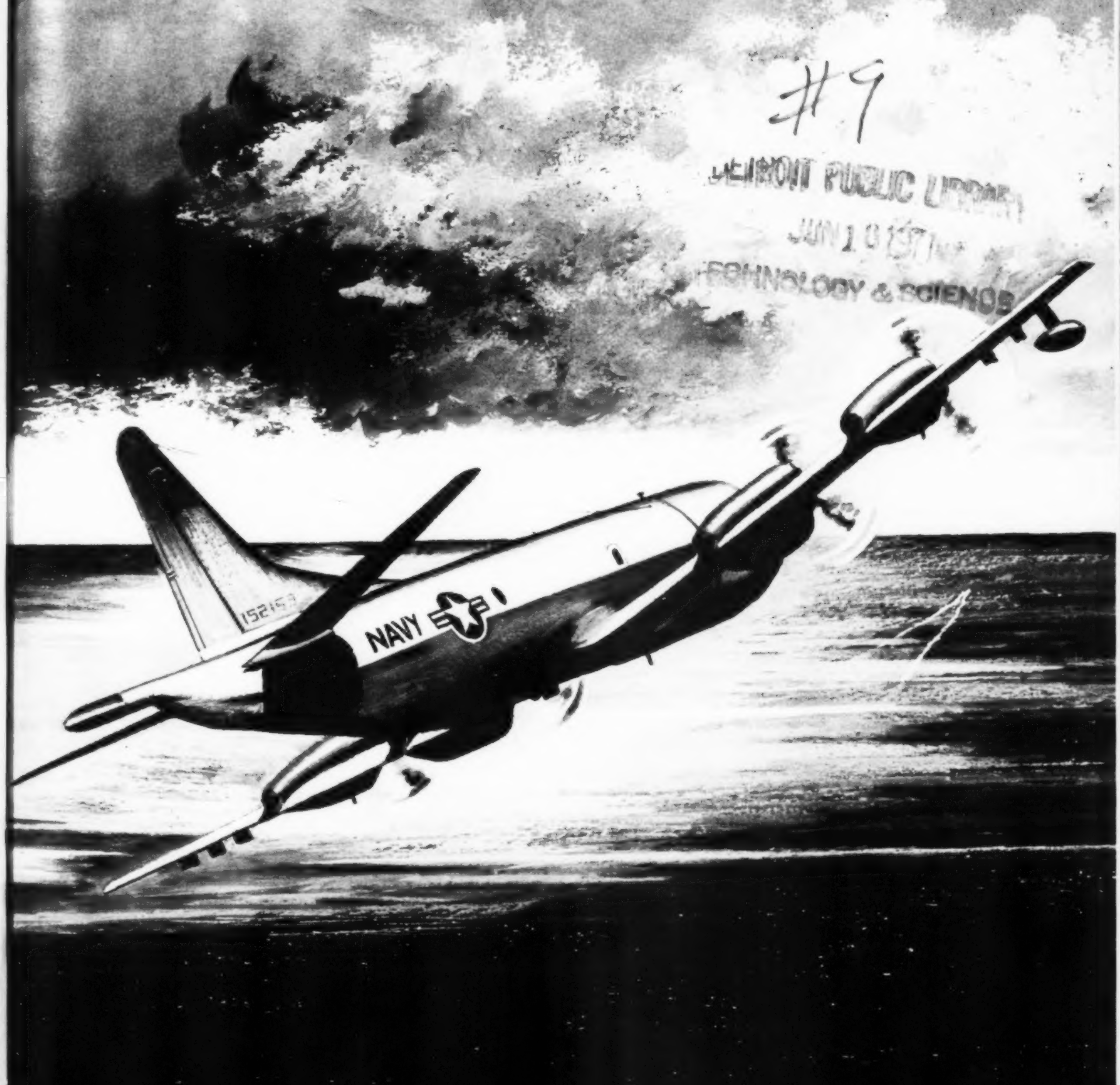
A Naval Safety Center Publication

# approach

MARCH 1971 THE NAVAL AVIATION SAFETY REVIEW




#9

# a review of aircraft accidents due to FUEL

The result of fuel system malfunction/mismanagement.

# EXHAUSTION

DURING THE PERIOD from 1 July 1967 to 8 January 1971, there were 52 major fixed-wing aircraft accidents caused by fuel exhaustion. Significantly, in 51 out of 52 accidents, the aircraft received strike damage, indicating that the average fuel exhaustion accident is likely to be serious, indeed.

The pilot was the primary cause factor in 29 of these accidents, 10 of them were caused by "personnel error," two were due to undetermined causes and 11 of them were due to material failures. A breakdown of these 11 material failure-caused accidents, by model aircraft, is presented in Chart 1.

The 10 accidents which were charged to "personnel error" involved the following factors:

- Two were caused by improper maintenance actions.
- Four were caused by improper/inadequate execution of airborne tanker policy during carrier operations.
- One was caused by failure of the ship to insure readiness of a divert field during CV operations.
- One was caused by inadequate/incorrect action by controlling agencies (tower, approach control and GCA).

Continued



**Chart 1**

**Fuel Exhaustion Accidents Caused By Material Failures**

**A-1H** – Failure of undetermined engine component – most likely the engine-driven fuel pump.

**A-4C** – Three accidents due to failure of undetermined fuel system component.

**A-4B** – Possible failure of engine-driven fuel pump or malfunction of fuselage cell transfer shutoff valve.

**A-7A** – Material failure of fuel transfer system.

**A-7E** – Probable material failure/malfunction of undetermined system/component of engine fuel system.

**F-4B** – Most probable cause was a bleed air leakage impinging on internal wiring at FS-249, melting solder connections and resulting fuel leakage caused a fire. At time of impact the engines had flamed out due to fuel starvation.

**DF-8F** – Navigation instruments, radio failed. Fuel exhaustion occurred before landing could be effected.

**TF-9J** – Failure/malfunction of undetermined engine fuel system component.

**US-2B** – Material failure of upper attaching bracket (forward outboard door hinge), broke between horn assembly and outboard door. AFC 489 not incorporated due to unavailability of change kits. Other factors: erroneous fuel quantity indications – wiring of fuel transmitters by another activity – had been improperly calibrated. On fourth practice gear up approach, port engine quit due to fuel starvation, resulted in a wheels-up landing.

Preflight planning forecast a low fuel state upon arrival at destination.

• One was caused by the use of incorrect navaids by the flight leader.

• One was caused by inadequate preflight planning and inflight leadership on the part of the flight leader.

This leaves 29 accidents in which the pilot was listed as the primary cause factor. These accidents are discussed below:

**Pilot Factor Accidents**

*Preflight Planning*

The mention of a fuel exhaustion accident usually brings to mind a pilot who failed to properly complete preflight planning for a long-range cross-country flight. This is sometimes the case but of the 29 accidents under consideration, it is the major factor in only three. One of these involved an F-4J which flamed out 1.5 miles short of the destination runway. The pilot's fuel planning indicated that the fuel remaining at destination would be marginal but "legal." It's hard to criticize anyone for undertaking a flight which is planned according to the book, so we won't. Rather, we will comment on the fact that, during the flight it became clear that the aircraft performance was not as good as the flight planning figures predicted. That is, winds were more unfavorable than predicted and as a result, ground speed was lower and fuel usage higher than planned. Nevertheless, the experienced pilot and RIO pressed on. In so doing, they passed up the opportunity to land at a suitable airfield adjacent to their flight path, some 135 miles short of the destination airfield. The result was two successful ejections and a lost *Phantom*. Another very similar case also involved a *Phantom*, only in this case, *the flight leader* was tagged with the primary responsibility rather than the pilot. In this mishap, there was good reason to believe that the flight would arrive at the destination airport with a low fuel state. Nevertheless, the flight took off anyway. Enroute, insufficient attention was given to best-range procedures. As a result, the aircraft used more fuel during the climb than was necessary. These facts still did not make an accident inevitable. The pilot had the option of diverting to a closer airfield but instead, he chose to press on. Again, one of the *Phantoms* in the flight of two flamed out a few miles short of the runway. Again, there were two successful ejections – and a lost *Phantom*.

In a third case, an F-4J flamed out on a cross-country flight just short of the runway. Investigation showed that fuel planning figures were incorrect. Another two successful ejections – and a lost *Phantom*.

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## Minimum Fuel Requirements

The *NATOPS General Flight and Operating Instructions Manual* (OPNAVINST 3710.7E) sets forth the minimum fuel requirements for flights of naval aircraft. Paragraph 326 is quoted below:

a. *Fuel Planning.* All aircraft shall carry sufficient usable fuel, considering meteorological factors and mission requirements, to fly from takeoff to destination, or to the approach fix serving destination and thence to an alternate airfield if one is required, plus 10 percent of planned fuel requirements. In no case shall the planned fuel reserve at destination or alternate, if one is required, be less than needed for 20 minutes flight, computed as follows:

(1) Reciprocating engine-driven aircraft – compute fuel consumption based on maximum endurance operation at normal cruise altitudes.

(2) Turbine power fixed-wing aircraft – compute fuel consumption based on maximum endurance operation at 10,000 feet.

(3) Turbine powered helicopters – compute fuel consumption based on operation at planned flight altitude.

b. *Inflight Refueling.* Aircraft shall carry sufficient usable fuel to fly from takeoff point to ARCPs (Air Refueling Control Point(s)), thence to a suitable recovery field in the event of an unsuccessful refueling attempt. In no case shall the fuel reserve at rendezvous point be less than 10 percent. For multiple inflight refuelings, the aircraft must have the required reserve at each rendezvous point. After the last inflight refueling is completed, the fuel reserve required for the remainder of the flight shall be in accordance with paragraph 326a.

c. *Delays.* Any known or expected traffic delays shall be considered *time enroute* when computing fuel reserves. If route or altitudes assigned by air traffic control will cause planned fuel to be inadequate, the pilot shall inform ATC of the circumstances, and, if unable to obtain a satisfactory altitude or routing, alter destination accordingly.

### Discussion

It must be emphasized that these are *minimum* fuel requirements. A pilot cannot rely solely upon meeting these *minimum* requirements and expect to come out smelling like a rose when, and if, things start turning to worms. Visualize a pilot who files an IFR flight plan from Airport A to Airport B with Airport C as his alternate. Let's say that he abides by the OPNAV *minimum* fuel requirements and plans the flight so that he has sufficient fuel to proceed to the fix serving Airport B and then to proceed to his alternate and still have a 10 percent fuel reserve. Upon arrival at the approach fix serving Airport B, the weather (at Airport B) is down to approach minimums for single-piloted aircraft. The pilot can legally commence an approach to Airport B even though he may know that this will deplete his fuel supply to the point that he will not have sufficient fuel to proceed to his alternate in the event of a missed approach. On the other hand, if he decides against making an approach to Airport B, he *will* have enough fuel to proceed to his alternate. This calls for a *critical* decision by the pilot; should he commence an approach to Airport B or should he go to his alternate? If his qualifications and proficiency as a pilot *are* anything less than outstanding he should go to his alternate. The important point here is, good headwork dictates that, all things considered, a pilot should have an *outstanding* chance of effecting a safe landing at destination before sacrificing his capability to proceed to his alternate. It is obvious that the decision to make an approach, in the cited example, is a critical one. The wrong decision could spell disaster. The way to keep from being placed against a hard rock like this is easy – allow yourself some gravy in your preflight planning. Allow yourself enough fuel to make the approach at destination (if you think there is any chance you might be tempted to do so), execute a missed approach and still have enough fuel to get to your alternate. Always leave yourself an out if you can. It's recognized that there may be compelling reasons, on occasion, to go max range but never do so without giving consideration to all pertinent factors, particularly to the weather.

A discussion like this could be pursued ad infinitum but just consider one final thought: 20 minutes of fuel, calculated at max endurance at 10,000 feet, is sometimes adequate for little more than finding a clear area, positioning yourself properly and pulling the curtain. Don't allow yourself to get into this position for no good reason!

Fuel exhaustion occurred 1.5 miles short of destination.

In a fourth case, an F-8B was lost when the pilot compounded preflight planning errors by a series of poor judgments in the air. Nearing destination (at altitude), the pilot was advised by the Center that his destination weather was 100 feet obscured and three-fourths mile visibility in fog. He then switched to tower frequency and received a report that the weather was 200 feet obscured and one mile in fog. He went back to Center frequency and requested an enroute descent and a GCA. He flew the GCA poorly (above glide slope) and as a result had to execute a missed approach. He was then cleared to his alternate but enroute he decided fuel was inadequate to reach the field so he requested clearance to a closer field. Weather there was 400 feet scattered, 500 feet overcast, three miles visibility in fog – and GCA was out of service. The pilot requested information on other emergency fields and requested vectors but by this time his fuel state was extremely critical. The end result was a successful ejection at 10,000 feet – and a lost *Crusader*.



Although this is primarily a discussion of major aircraft accidents, it seems appropriate to remark on an *incident* at this point. In this case, a T-1A pilot filed for a destination which was beyond the range of his aircraft. He entered the figures for estimated time enroute and fuel on board on the DD-175. The operations duty officer challenged him because his figures did not show that he had the fuel reserve required. Thereupon, the pilot changed the figure for the time enroute in such a manner that he had the required fuel reserve – on paper, that is. Unfortunately, this did nothing to actually increase his fuel reserve and the end result was a flameout 1.5 miles short of the destination airport. The pilot successfully executed a flameout approach to a nearby field but this does little to mitigate his serious errors in judgment before and during flight.

This raises the possibility that other flights are undertaken without proper or adequate preflight fuel planning and that their successful completion is due more to luck than planning. This may be, but there certainly is no reason to believe that flameout approaches are anything but an extreme rarity. However, there is considerable evidence that many flights are completed under "low state" conditions. This is a very undesirable situation because of the ever-present possibility that inadequate fuel planning will lead to inflight fuel exhaustion. About the only thing necessary to turn a low state approach into a fuel exhaustion accident is an emergency which closes the field for a few minutes. Furthermore, it is known that a number of accidents have occurred where low fuel state was a contributing factor, even though the accident itself was not properly classifiable as a fuel exhaustion accident. For example, an F-8 pilot unintentionally landed wheels up. This was classified as an unintentional wheels-up landing caused by poor judgment *but* a definite contributing factor was distraction caused by anxiety over a low fuel state.

So, even though only four accidents during this period were basically caused by inadequate preflight fuel planning, the importance of preflight planning must not be ignored.

*Monitoring Fuel While Airborne*

Any preflight plan is a tentative plan. Once airborne, the pilot must adapt his flight to the actual inflight situation. Therefore, monitoring fuel while inflight is

just as important as good preflight planning. In three of the 29 pilot-caused accidents, fuel exhaustion occurred because the pilots failed to monitor their fuel gages. Significantly, all three of these accidents occurred during tactics flights. These included an F-4B and an F-4J (on separate flights) both of which flamed out during ACM (Air Combat Maneuvering) practice. In both cases, the pilots failed to recognize the extent to which combat rated thrust can deplete the fuel supply. Had proper attention been given to fuel gages, this fact would have become apparent to the pilots before it was too late. In one case, the RIO did note the rapid depletion of the fuel but was unable to warn the pilot because of a faulty ICS connection. In the third case, an F-8J pilot was engaged in air-to-air gunnery practice on a towed banner. He used afterburner at a certain place in the pattern on each pass, whether he needed it or not. As a result, he used considerably more fuel than other members of the flight. He failed to recognize this because he was not monitoring his fuel gage. A point to be noted here is that a flight leader should insure frequent fuel checks are made by all members of a flight, particularly when engaged in tactics.

*Fuel Management*

It is bad enough to use all fuel on board an aircraft and have the engine quit because of fuel exhaustion. It is even more unsatisfying to have a substantial amount of fuel on board the aircraft and fail to get it to the engine. In 11 of the 29 pilot-caused accidents, there was a substantial amount of fuel on board the aircraft when the engine(s) quit. Material failures/malfunctions of fuel system components were involved in five of these accidents. However, the pilot was listed as the primary cause factor in each case because the investigators and reviewers concluded that the accidents would not have occurred if the pilot had properly understood the fuel system and had managed his fuel with good judgment and in accordance with established procedures. These accidents are discussed below:

- Two accidents involved TransPac flights. One was an RA-3B. In this case, the aircraft had erroneous fuel quantity gage readings and a fuel transfer system failure. The investigators and reviewers cited numerous contributing factors but concluded that the pilot could have landed safely if he had conserved his fuel and managed it properly. The other case involved an F-4J. In this case, the pilot failed to transfer external fuel to internal tanks at the proper time. As a result, a malfunction in the fuel transfer system was not detected until the flight had reached a point from which a safe landing could not be effected.
- One accident involved an A-6A aircraft. In this case, the pilot accepted the aircraft for flight when there were obvious indications of a malfunction in the fuel pressurization system. Thereafter, he failed to abort the mission when the indications of a malfunction persisted while in flight. Moreover, he failed to correctly use the primary fuel quantity indicating system and exhibited a lack of fuel consciousness throughout the flight. Altogether, indications are that the pilot had an inadequate understanding of the aircraft fuel system.

The fuel selector was improperly positioned.

- One accident involved an SP-2E. The No. 2 jet engine flamed out on the takeoff roll. After liftoff, power on the No. 1 jet engine was reduced to maintain directional control. The pilot climbed the aircraft to 3000 feet, intending to circle the field to complete a test flight. Thereafter, the No. 1 jet engine flamed out and the No. 1 reciprocating engine failed, in succession. The aircraft crashed short of the runway. The flameout of the No. 2 jet engine was determined to be due to material failure but the failures of the No. 1 jet and No. 1 reciprocating engines were attributed to mismanagement of fuel.
- An instructor pilot in an O-1C allowed a student pilot to induce fuel starvation by performing sideslips,

uncoordinated turns and reversals. Thereafter, he failed to take the proper corrective action of turning on the auxiliary fuel boost pump. As a result, the engine quit and the aircraft crashed.

The remaining six accidents where the engine(s) failed with fuel still on board the aircraft are discussed below:

- Two T-2B student pilots are believed to have operated the landing light switch instead of the fuel transfer switch, as they intended to do. These errors were undetected because the students failed to understand/monitor the operation of the fuel transfer system.

- Two UC-45J and one SP-2H aircraft crashed because of incorrect positioning of fuel tank selectors.

- An A-6A crashed during a night FMLP flight (with several thousand pounds of fuel in the wing tanks) because the pilot did not understand the fuel system and recognize the necessity to transfer fuel.

To recap up to this point, of the 29 pilot-caused accidents, three involved inadequate preflight planning, three involved failure to monitor fuel gages during tactical operations and 11 involved inadequate knowledge/management of fuel systems (including five which also involved a material failure/malfunction of some type). This leaves 12 pilot-caused accidents which have not yet been discussed. It is difficult to categorize these accidents because of the wide variety of circumstances involved so we will present a brief description of each:

- TF-9J – Student pilot on a bingo from CV. Made many errors in navigation, use of available navaids and emergency facilities. Flamed out, ejected.

- RA-5C – Diverted ashore during CV operations. Crew became lost, eventually ejected.

- A-6A – Hydraulic system malfunction led to inability to drop landing gear. Landing gear problem eventually corrected. Pilot remained airborne needlessly after gear was down. Flamed out.

- A-7A – Wingman on combat hop. The flight leader was shot down. The wingman remained overhead – failed to make a timely decision to divert. Tanking attempts failed. Flamed out.

- A-7B – During CV ops pilot had landing gear problems. Made several passes. Failed to advise anyone of his low fuel state even after it reached emergency level. Airborne tanking operation unsuccessful. Engine flamed out. Pilot ejected.

- F-4B – Overwater flight, failure of navigation equipment. Aircraft was vectored over land but on handoff to GCA, lost radio contact. Crew had no charts or maps in aircraft and flew around for 43 minutes trying to find landing place. Finally abandoned aircraft.

- F-4B – Leader of two-plane flight returning to CVA from combat sortie selected tacan on DLG instead of CVA. Made approach on DLG in error. When error realized, too far from ship. Ejected when fuel exhausted.

- F-4J – Night approach to 15 to 20 foot pitching deck. Technique waveoff on first pass; ship dropped out from under aircraft on second pass, resulting in a bolter. Pilot called, "Cleaning up for bingo," then mistook transmission to other aircraft as order for him to make another pass. On this pass, pilot mistook waveoff signal for other aircraft as being intended for him. Ordered to divert; told that A-7 tanker had him in sight and would join on him enroute, the pilot turned toward an airborne light which he mistook to be the A-7 tanker. Finally rendezvoused with A-7 tanker but flamed out before plug-in could be made.

- F-8E – Hung ordnance during practice bombing mission in ConUS. Diverted to airfield but got lost enroute. Failed to make use of all navaids. Finally ejected.

- F-8A – Pilot became lost on Fam flight. Did not conserve fuel. Did not use all available navaids or follow instructions of ground stations trying to assist him. Finally ejected.

It is suspected that student erroneously operated landing light switch instead of fuel transfer switch.

- A-7E – Diverted ashore during CV ops; navaids lost; ejected.
- A-4E – Pilot took off without checking fuel quantity. Flamed out shortly after takeoff. It was later estimated that the aircraft had only 500 to 600 pounds of fuel on board at takeoff. The aircraft had not been refueled after last flight because of ordnance aboard. Then before this could be corrected, the aircraft received minor damage while parked on the line. It was then towed into the hangar, repaired, preflighted with yellow sheet signed off; however, it was never refueled.

**Discussion**

This study of fuel exhaustion accidents shows that a relatively small percentage of accidents can be attributed to failure to complete adequate fuel planning prior to flight. This seems to indicate that the vast majority of pilots do plan their fuel requirements carefully when undertaking a cross-country flight. However, the loss of three F-4s and one F-8 for no good reason is a thought-provoking matter and should serve to emphasize the need to insure adequate fuel planning for *all* cross-country flights.

Fuel planning should not be limited to cross-country flights but should be an important consideration on every flight. The accidents which we have briefed in this article show that a substantial number of accidents are caused by failure to monitor fuel in flight or because of the pilot's lack of understanding of the fuel system. Therefore, preflight planning alone is no guarantee that the flight will end successfully. Today's aircraft often have very complex fuel systems and cannot be adequately managed by pilots unless they have a thorough understanding of how the system works. This should be a matter of concern to those in supervisory positions, as well as individual pilots.

A substantial number of aircraft were lost during the course of carrier operations. While the pilot was often listed as the primary cause factor in these accidents, it was evident from many of the reports that there are problems in the area of supervision. These include:

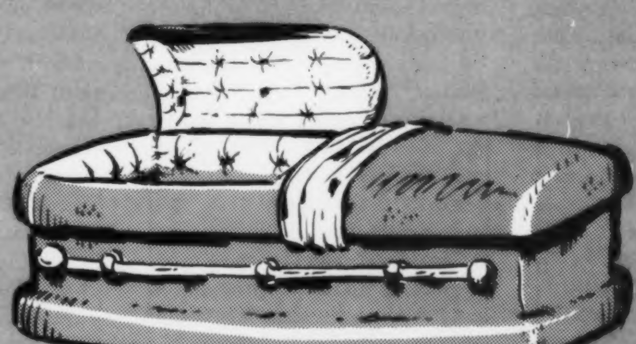
- Overscheduling of pilots.
- Scheduling pilots who are not proficient.
- Inadequate airborne tanker policy/control.
- Unqualified squadron representatives assigned to CCA watches.
- Lack of coordination in insuring adequate divert fields are available.

Altogether, the aircraft accident caused by fuel exhaustion is a problem which merits our best attention. Most of the accidents discussed in this article could have been prevented by better planning at all levels, by better aircraft maintenance, by better training of pilots and by good headwork while airborne. It's something to think about.



**Don't be caught sitting on your seatbelt!**

**Super Delux Model**



**A real traffic stopper. No one will pass you as you enjoy the satin-smooth ride of this wonder vehicle. Comes equipped with six chauffeurs. Sleeps one. This model is in heavy demand among speeders and drinkers, who are literally dying to get one. To insure early delivery, booze up before driving down to your dealer for yours.**

# Short Snorts

Thanks to the speed of today's jets, it's now possible to have breakfast in New York and arrive in Los Angeles in time to find nobody awake yet.

Ace L.

### Swim Call

IT was a bright sunny day at this particular eastcoast air station. Almost unnoticed among the hustle and bustle was a taxi director attempting to direct a large multiengine aircraft into a parking spot. Two other aircraft were already occupying the normal parking spots; therefore, the taxi director was directing the aircraft on a wide swing which took it near the sea wall. As the aircraft approached the seawall at right angles to it, the flight crewmembers in the cockpit of the aircraft commented that a little reverse thrust on the engines could blow the taxi director back into the water. Before much more thought could be given to this statement, the taxi director gave a port turn signal and moved rapidly backward and to the left in order to maintain his position at the front of the airplane. In his hurry to regain his position, the taxi director backed smartly off the edge of the seawall and fell into the water.

Although soaking wet and very embarrassed, the unhurt director climbed back up over the seawall and helped park the aircraft with no further problems.

Fortunately, no serious injuries resulted from this incident but there was certainly the potential. Action by either the taxi director or the flight crew of the aircraft could have prevented this incident. The taxi director was parking the aircraft in a location that was not normal. Had he taken the time to fully orient himself with regard to the position of the seawall, perhaps he would not have gone for the swim. When the flight crew noticed the aircraft director getting close to the edge of the seawall, the aircraft should have stopped until the director could be made aware of his danger.

### Don't Rush

PILOTS of multiengine aircraft have many advantages over pilots of single-engine aircraft when one engine malfunctions. The former usually have plenty of time to use the good engine to get additional altitude, attempt a relight (if appropriate), reduce weight and let the whole world know they have problems. The latter, however, generally have precious little time to do any of these things.

One day, deep in Dixie, the pilot and RIO in a *Phantom* took off on a scheduled fighter-intercept mission. During climbout the starboard fire-warning light illuminated. Now, a fire-warning light is guaranteed to get the attention of even the most callous pilots, and this crew was no exception. Throttles had been set at max CRT and the pilot, upon seeing the fire-warning light ON, reduced the starboard throttle to IDLE. The light went out and a check of the detection system indicated it was functioning properly. The flight leader recommended a return to base and an arrested landing. His wingman (who was having the problem) allowed as how he agreed wholeheartedly. He asked and received tower clearance to make an immediate single-engine landing into the M-21 gear at the approach end of an off-duty runway. Like the proverbial boxcar rolling downhill he contacted the M-21 gear at about 150 knots weighing an estimated 43,000 pounds. He did not deploy his drag chute and wiped out the crossdeck pendant with ease. He then attempted to waveoff with max CRT (combat rated thrust) on the good engine but before the aircraft could accelerate enough to get airborne the pilot was lucky enough to successfully engage a second set of M-21 gear.

Postflight inspection revealed that the fire-warning sensing element had been rubbing on the impingement start duct which caused the warning light to illuminate.

The squadron skipper commented that a very serious accident was barely avoided and the sequence of events reflected poor headwork by the

pilot. The aircraft was 9000 pounds over recommended single-engine landing weight and the pilot elected an off-duty runway of 8000 feet instead of the duty runway which not only was 12,000 feet long but also was equipped with E-27 arresting gear.

It would seem from the Monday morning seat and the C.O.'s comments that the pilot overreacted. It is mighty comforting to fly an aircraft with two or more engines knowing that if one fails the other(s) will get you back home safely. However, when the pucker factor hits the red line, most are inclined to lose sight of the need to take time to carry out proper procedures. If a multiengine aircraft loses one power plant it isn't going to fall out of the sky unless the pilot compounds the emergency. (Before too many of you write irate letters taking exception to that statement it is agreed that under certain conditions of weight, dirty condition, crosswind, obstructions and engines which won't put out 100 percent, there is a point when you don't have time to sit back, light a cigarette and munch a sandwich while "looking things over.") So keep it flying, secure what has to be secured, announce what is taking place, get into position to land or eject if the whole flight turns to worms, dump fuel if it is required and set up for a good landing. *Take your time, thank you!*

### Not So PAR Excellence

DURING an initial post-PAR functional test flight of an S-2D, following a satisfactory check of the stall warning system at 8000 feet, a normal approach to stall recovery was commenced. The nose was lowered while simultaneously adding power on both engines to 35 inches MAP. The landing gear was retracted and, as the airspeed increased through 100 knots with the flaps being incrementally raised, the port engine surged and then failed. Fuel pressure was noted to be about 8 psi. The auxiliary pumps were turned on and the engine partially recovered with the fuel pressure reading 14-16 psi. Again the engine surged and failed. As the airspeed approached 150 knots the engine was feathered and an uneventful landing was made at the NAS.

The engine failure was attributed to a loss of fuel pressure caused by two fuel tank test plugs that were installed in the port outboard cell for a pressure check and not removed prior to flight. The plugs were installed in the cell fuel supply connector and cell vent interconnector to the center forward main cell.

Since the outboard cell was isolated from the other cells, it is believed that a quantity of air was drawn into the fuel manifold during the rapid pushover in the recovery from the stall warning system check. The air was then drawn into

'Gee, Doc, it's not that I'm overweight, I'm just not tall enough.'

the fuel pump, disturbing the carburetor balance and dropping the discharge nozzle pressure below 9.5 psi and thereby interrupting the fuel flow.

A check of all fuel supply lines, strainers, valves, pumps, the carburetor and other cells revealed no additional deficiencies. The plane was reflown a week later with no engine power or fuel system discrepancies. The test flight included several approaches to a stall with normal pushovers, unusual attitudes and rapid power applications.

The C.O. in his endorsement to this mishap stated; "Even though the cause of this mishap has been ascertained and the individual primarily responsible identified and made acutely aware of the seriousness of his inadvertent error, several other steps have been taken or initiated to preclude recurrence." They are detailed below:

The work documents are being modified to include certification of completed rework by individual fuel cell as opposed to each wing tank.

Cognizant supervisors have initiated an accountability system for cell pressure test plugs so that they will be drawn from and returned to a single control point.

Completed repairs on fuel cells will be double-checked and certified by two individuals.

A quality assurance point will be added to the documentation to ensure that each cell receives proper verification action following a reopening after once completing normal processing.

The C.O. of this NARF recognized the seriousness of this incident and has taken corrective action to prevent a recurrence. However, had this action been taken earlier, it's unlikely that this mishap would have occurred. ◄

# Are You Prepared?



TWO OF the aviation safety officer's responsibilities are accident prevention and accident investigation. If a squadron is fortunate enough to have a dynamic ASO who works well with a maintenance department full of sharp, safety-conscious petty officers and with strong command backing, accident investigation may never become an area of concern. However, it is rather obvious that we cannot all be that lucky since aircraft accidents are still an unpleasant fact of life. The question is, could it happen in your squadron?

"My squadron? Of course not! We have the most dynamic aviation and ground safety programs in existence. We have now logged 14,000 accident-free hours, won two safety awards in a row, received high outstandings on our last two AdMats, have a 4.0 quality assurance branch, etc., etc."

So you have the law of averages beat by many hours but will it last forever? Hopefully yes, but realistically, sooner or later (preferably much later) something could happen to tarnish that well deserved record. If it happens on your watch, are you prepared?

The anonymous author of this article is currently a squadron ASO who has recently experienced a "catching-up" of the law of averages. If he had been well prepared for the accident, this article would not have been written – but he wasn't. Here's the story:

I was an ASO with an accident-free year of experience in a previous command and had recently assumed the duties of ASO in my new squadron. I had joined the squadron at sea and we were now home for a month before a lengthy deployment to WestPac. On that fateful morning, I walked into the duty office to pick up my leave papers and found the duty officer on the phone. He covered the mouthpiece long enough to inform me that a fireball had been sighted 20 miles from the field and it was suspected that one of our aircraft had gone down. After another two minutes on the phone, he confirmed that it was aircraft 654 which was piloted by our squadron C.O. A member of the State Highway Patrol had seen the plane explode at 6000 feet and observed one parachute. The patrolman reached the

crewman (the NFO) after he landed in a pine tree and relayed the information to the air station.

The pilot did not survive the ejection and the NFO sustained flail injuries. As a result, the NFO was not expected to be available for questioning until the following day. It was tragic to lose the C.O., but at least the NFO had survived and although the accident could never be undone, I expected the NFO would be able to supply enough details to enable the accident board to determine the cause of the accident. It sounded like a simple matter . . . but it wasn't.

To begin with, there were three aviators and one flight surgeon appointed to the accident board by the squadron preaccident plan. Right off the bat, the senior member was eliminated because he was (naturally) not senior to the C.O. (Not until three days later was it brought to my attention that OPNAVINST 3750.6F requires that all members be from other commands when the C.O. is involved in an accident.) The flight surgeon proceeded to the civilian hospital where the NFO was taken. That left two of us on the board, so a maintenance officer was quickly appointed and a technical representative volunteered his services. The four of us arrived at the scene (30 miles by car) to find roughly one square mile of fields and orchards dotted with pieces of aircraft. To add to the frustration of the scene that greeted us, word was passed through the State Police that the NFO had stated he was unable to talk to the pilot prior to the ejection and that he had no ideas concerning the cause of the accident.

All was not lost as I had recently attended the NAVSAFECEN's ASO course in Norfolk and was able to recall a few tips passed on by their investigation team. One officer was assigned to take witness statements, one officer was assigned to ensure that the photographer got shots of all significant parts, and the technical representative and I started identifying and plotting a scale diagram of aircraft wreckage.

Meanwhile, back at the squadron we were fortunate enough to have an ex-safety officer to see that the appropriate phone calls and messages were completed. (It is questionable whether the squadron duty officer was indoctrinated well enough to handle this task.) In addition, about 24 hours after the accident occurred, two Naval Safety Center investigators arrived, followed shortly by two factory investigators. Everything was almost under control when three long days after the accident, a brand new aircraft accident board was appointed in order to conform to OPNAVINST 3750.6F.

The suspected cause of the accident was eventually determined by the board, but in retrospect the whole evolution could have been handled more easily if I had been able to answer positively the questions which I now put to you squadron C.O.s and ASOs:

- When was the last time you updated your preaccident plan?
- When was the last time the duty officers were briefed on the preaccident plan? Could they adequately handle all of the required reports if none of the aircraft accident board members were available?
- When was the last time the aircraft accident board was convened for the purpose of briefing individual duties in the event of an accident? Do all members know how to take complete and accurate statements from witnesses, how to use a photographer, how to handle the news media, how to react to souvenir hunters, etc.?
- When was the last time you held a crash drill? Will your key personnel know which responsibilities they should attend to first?
- Does your air wing have an aircraft accident board appointed to investigate an accident involving a C.O.?
- Are the first lieutenant and leading chief aware of their responsibilities as far as watches, foul weather gear, camping gear, food, etc., are concerned?

There are many more areas that require attention if a command is going to be prepared for that accident which does not always occur in some other squadron. The point is, if it does happen to you, will you be prepared or will you have to learn from hard experience as I did?

# How To $ave

ANYTIME an aircraft moves, whether by muscle, tow or its own power, there is some chance that it may be damaged. Care, confidence and caution should be exercised to ensure safety, especially in ground or flight deck operations. *Care* meaning that the area is clear. *Confidence* meaning that a full crew is on hand, properly equipped and properly trained. *Caution* meaning that proper taxi/tow speeds are used, taxi lines observed and clearance, if needed, has been received. Sometimes even when most of the above conditions are satisfied there is still an incident or a ground accident. Other factors such as wind, weather, darkness or slippery surfaces can render null and void what ordinarily would pass for careful, confident and cautious handling.

A series of mishaps is going to be narrated in the form of a quiz. You are asked to review each one, especially when it concerns the type aircraft you are most familiar with, and then see if you can spot the explanation/comments of the reviewing authority appropriate to the incident.

# ve“Uncle” $ome Dough

### Incident

No. 1 – *SH-3D* – It was spotted fore and aft on No. 1 elevator of an LPH and was to be moved from the flight deck to the hangar deck. The tail pylon wasn't folded. The hangar deck handling crew hooked up a tractor but couldn't pull the tail inboard because of insufficient clearance between the tail rotor and the aft elevator lifting cables. After unhooking the tractor and straightening the tailwheel an attempt was made to push the helicopter forward on the elevator by hand. Seven pushers were used. The wind was 40 knots dead ahead and the ship was pitching about four degrees. When brakes were released to push the helo forward it moved aft about a foot and a half – just enough to bend the horizontal stabilizer on the elevator lifting cables.

No. 2 – *UH-2C* – It was in hangar bay 2 and needed to be moved. An SD1D (spotting dolly) was being attached to the tailwheel of the helicopter when it struck the underside of the tail pylon extension – flattening it and popping most of the rivets in the damaged area.

No. 3 – *RF-4* – An Air Force visitor in a *Photo Phantom* arrived on a cross-country flight and was parked on the transient line. Shortly after his plane was chocked but before engine shutdown an A-4 taxied out of the spot next to the RF-4. While making a left turn out of the line area to join the taxiway the A-4 jet exhaust blew an A-4 ladder into the port droptank of the RF-4. Line personnel stated that in the midst of moving other GSE (NC-5, GTC-85 and chocks) the ladder was overlooked and left on the deck between the two aircraft.

No. 4 – *TA-4J* – It had to be towed to the flight line from an area where it had been painted. The brake rider was unfamiliar with the canopy controls and could not get the canopy opened. He became excited at being "trapped," removed the canopy emergency jettison safety pin and intentionally blew the canopy because he was scared.

No. 5 – *RA-5C* – It was being moved into the hangar when the horizontal stabilizer tip contacted an NR-10 mobile air conditioning unit. The plane was being moved without sufficient wing and tail walkers.

**Answers: 1e, 2a, 3c, 4b, 5d.**

### Comments

A. The primary cause was not using the proper equipment. The move called for a tractor and towbar. Additionally the driver was attempting to attach the SD1D without a plane director and had been cautioned previously against using the dolly because sufficient clearance does not exist under the tail pylon.

B. Maintenance supervisory error was the major cause factor as the brake rider was not qualified to be in the cockpit. The importance of thorough training of all maintenance and ground handling personnel and the accurate recording of their level of training cannot be overemphasized – to ensure that only qualified personnel work on or man aircraft. Qualified personnel were available. In the rush to get aircraft moved to the line the maintenance control supervisor erred.

C. Investigation of this mishap revealed that servicing personnel error is a primary cause factor and supervisory personnel error is a secondary cause factor. Although the plane captain involved seemed alert and attentive to duties, the possibility of this mishap from loose gear was overlooked. This transient line is very busy on weekends and this was one of those days. The A-4 pilot was unaware that his jet blast would blow up FOD. This line mishap resulted in only minor damage but caused several hours delay while the damaged droptank was removed and replaced to enable the pilot to return to his home base. To preclude recurrence, all personnel involved in handling transient aircraft have been rebriefed on their responsibility to keep the line area clear, gear properly stowed and the absolute discipline required of handlers.

D. This incident resulted from noncompliance with an existing directive on ground handling of aircraft and a lack of proper supervision. The causes and implications of this incident have been brought to the attention of all maintenance supervisors. A squadron instruction is being prepared on the subject. There is no excuse for the absence of good headwork, the disregard for a safe margin of error and the failure to provide supervision in an obvious potentially hazardous evolution.

E. With 40 knots of wind, a four-degree pitch and in the absence of adequate maneuvering room for a tractor, the hangar deck director's decision to reposition the helo by hand was unwise. A better course of action would have been to send the helo back to the flight deck where it could have been repositioned with a tractor.

Continued

A type of incident which annually is responsible for large expenditures of man-hours, material and money is the type involving misunderstood/incorrect hand signals between pilot and plane captain. For example, an E-1B had just been recovered and was taxiing forward to be spotted when the pilot noticed that the flaps would not raise. The flap selector was UP but the flaps were DOWN. The tower was notified of the problem. Meanwhile the flap selector was recycled twice with no change in the flap position. The flaps-down signal was given to the taxi director and the plane captain. The latter misunderstood the signal, assumed it was strictly a wingfold failure, proceeded into the wheelwell and folded the wings with flaps down by actuating the manual fold button. This mishap (both flap pushrod assemblies were broken) was the result of a combination of misunderstood signals and haste to unlock the deck because there wasn't enough room to clear the deck with the wings extended. The only solutions were to have changed the spot for one which would take the aircraft with spread wings or accept the locked deck until a hydraulic jenny could be connected and the flaps raised before folding the wings.

Another type of mishap which also takes a regular toll is the kind that pilots usually refer to, *after the incident*, by saying it didn't feel right or it didn't sound right. This could refer to brakes, engines or controls. For example, an S-2E pilot made a normal landing ashore touching down at about 100 knots and as he applied brakes the aircraft swerved left. Right brake pressure was increased to stop the swerve but the brake locked and the tire blew. The aircraft was stopped on the runway with no other damage. Prior to takeoff the pilot noted that the right brake required more pressure than the left for symmetrical braking. However, upon landing he forgot about the difference and did not allow any margin for the condition. A taxi test after a tire change and before any maintenance actions revealed a grabbing/dragging left brake. A review of the records also showed a total of six brake/tire discrepancies and three tire changes in the preceding month. All writeoffs involved changing the wheel and tire assembly or bleeding the brakes. No maintenance was performed on the brake assembly nor was a taxi check conducted before the runway incident. Examination after the incident revealed that the brake assembly stator plate was badly warped and had been the cause of all the trouble.

The annual man-hours expended to repair incident damage and the dollar cost of the repairs is staggering. Would you believe that the cost of repairs if used as a pay raise would provide a substantial pay increase for everybody?

So how do we help ourselves and "Uncle" too? One submits the following hints for consideration:

- Know your job and never, *but never*, try something you're not qualified to do.
- Know your men and ensure that each is qualified to do whatever you assign them to do.
- Assume nothing. Be sure.
- Check the equipment to be used in any evolution and ensure the right equipment in good working order and in sufficient quantity is being used.
- Consider the time to do the job and do not rush – into trouble.
- Follow directives and directions to the letter.
- Plan ahead. Second guess yourself and consider what might go wrong and what you will do if it does.
- Investigate if it doesn't look right, feel right or sound right.
- T-H-I-N-K.

The man who says it can't be done is generally interrupted by someone doing it.

Elbert Hubbard

# TCA

## A New Concept in Traffic Control

THE FAA is proceeding with the implementation of the rule which established a new concept of traffic control for certain terminal areas. TCAs (Terminal Control Areas) will be designated at most of the major airports throughout the U.S. All traffic in these areas will be under the jurisdiction of ATC. This action is aimed at reducing the potential for mid-air collisions.

Terminal Control Areas consist of controlled airspace extending upward from the surface to specified altitudes within which all aircraft are subject to certain operating rules and pilot and equipment requirements. Terminal Control Areas will not be uniform in size but instead will be tailored to each individual area. Generally speaking, the top altitude will be about 8000 feet above the airport elevation.

Requirements have been set forth for operation within TCAs designated as Group I and Group II. These TCAs have been identified through analysis of the operational needs of each area and have been individually tailored for each area to meet the needs of its users. Terminal Control Areas have already been designated for the Atlanta, Chicago and Washington, D.C. terminal areas.

Present plans call for TCAs at the following locations:

| *Group I* | **Group II* | |
|---|---|---|
| Atlanta – Effective date 6/25/70 | Cincinnati | Minneapolis |
| Washington – Effective date 2/4/71 | Cleveland | Newark |
| Chicago – Effective date 8/20/70 | Denver | New Orleans |
| Boston | Detroit | Philadelphia |
| Dallas | Houston | Pittsburgh |
| JFK International | Kansas City | Seattle |
| LaGuardia | Las Vegas | St. Louis |
| Los Angeles | | |
| Miami | | |
| San Francisco | | |

*Tentative locations

Continued

### Operating Rules and Pilot Equipment Requirements

Regardless of weather conditions, an ATC authorization is required prior to operating within a TCA. Included among the requirements for operation within a TCA are:

• Two-way radio capable of communicating with ATC on appropriate frequencies.

• A VOR or tacan receiver. This is not required for helicopters.

• An appropriate transponder beacon. This is not required for helicopters or for IFR flights at airports other than the primary. Additionally, this is not required for VFR flights at Group II locations.

• Private pilot certificate or better in order to operate at the primary airport. This is not required at Group II airports.

• Unless otherwise authorized by ATC, large turbine powered aircraft must operate at or above the floor of the TCA while operating to or from the primary airport.

Additionally, there is a 200 kias limit for aircraft operating beneath the depicted floors of a TCA and within the VFR corridor.

IFR flights operating within a TCA will be conducted in accordance with current IFR procedures except that pilots of large (over 12,500 pounds) turbine powered aircraft should operate at or above designated TCA floors while arriving/departing the primary airport. Such aircraft will also avoid the VFR corridor (where established to allow for uncontrolled transit operations through the TCA).

Arriving VFR flights should contact ATC on specified frequencies and in relation to geographical fixes shown on local charts.

Departing VFR flights are requested to advise ground controllers of the intended altitude and route of flight to depart a TCA.

Aircraft not landing/departing the primary airport (i.e., the airport for which TCA is designated) may obtain an ATC clearance to transit a TCA when traffic conditions permit.

### ATC Procedures

All aircraft will be controlled and separated by ATC while operating within Group I TCAs. Large turbine powered aircraft will be separated from all other aircraft within Group II TCAs. Although radar separation will be the standard primary method of separation used, approved visual separation and other non-radar procedures will be applied as required or deemed appropriate.

The assignment of radar headings and/or altitudes is based on the provision that a pilot operating in accordance with visual flight rules is expected to advise ATC if compliance with an assigned route, radar heading or altitude will cause the pilot to violate such rules.

### Publication

An extensive charting and publication effort is being undertaken with respect to the TCA program. Each TCA will be depicted on new VFR Terminal Area Charts. These charts, which will be similar to the former Local Aeronautical Charts, will include a plan view of the TCA on the face of the chart and the back of the chart will have a resume of pilot operating procedures for the information and guidance of VFR flights. A notation will be made on other aeronautical charts to inform pilots about the TCA environment and to refer them to the appropriate VFR Terminal Area Chart. The Airman's Information Manual will also contain a graphic portrayal of each TCA and pilot operating procedures for each Terminal Area.

It will pay to brush up on these procedures. For instance, anyone planning a flight into Andrews will be affected since Andrews is in the Washington Terminal Control Area which became effective 4 February 1971 and is shown in Fig. 1 to give an idea of what to expect. ◄



# WASHINGTON TERMINAL CONTROL AREA

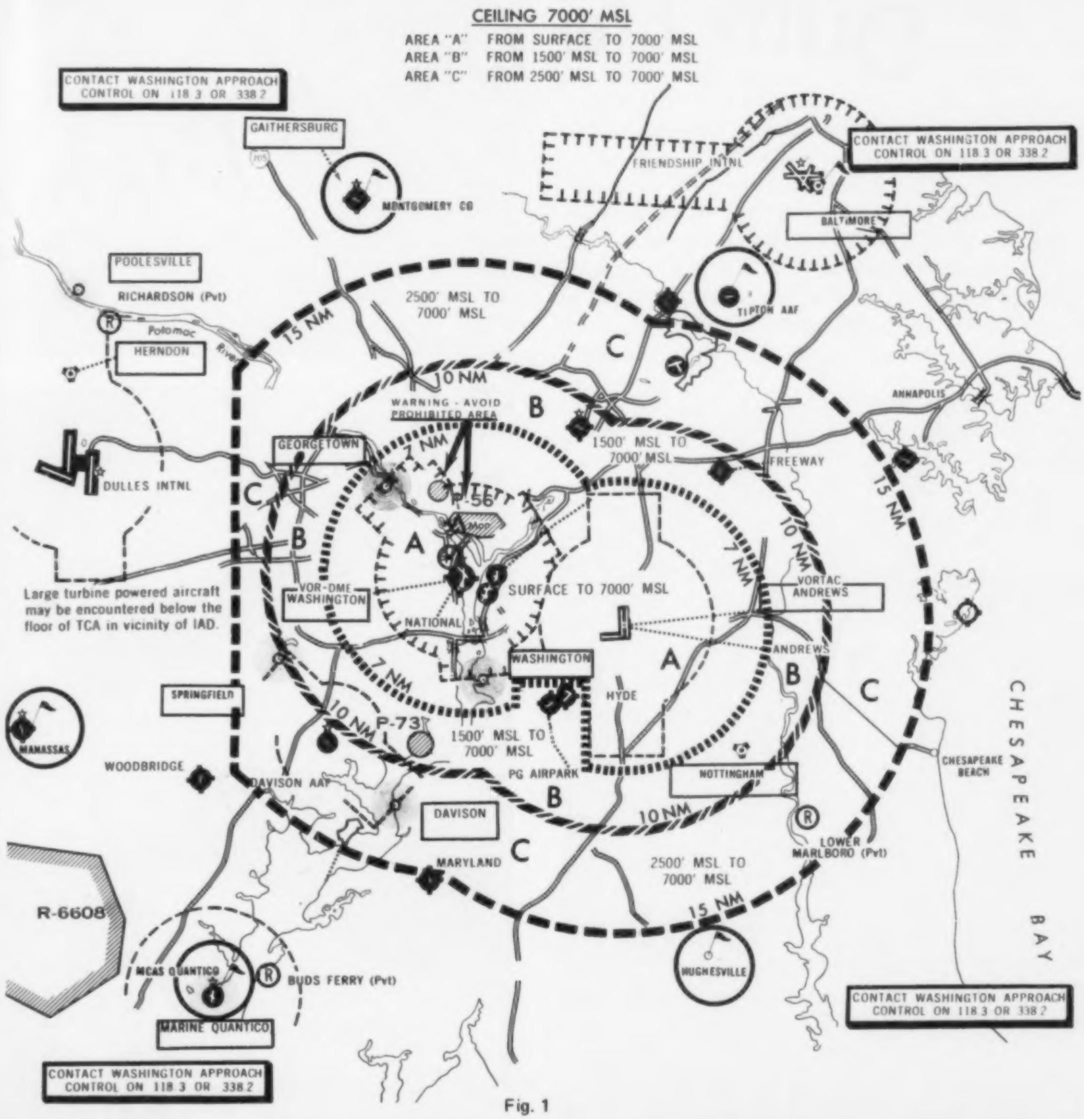



Fig. 1



## FLIP Changes

THE DEPARTMENT of the Air Force, Headquarters Aeronautical Chart and Information Center, St. Louis, Missouri has notified the Naval Safety Center of the following change to FLIP documents:

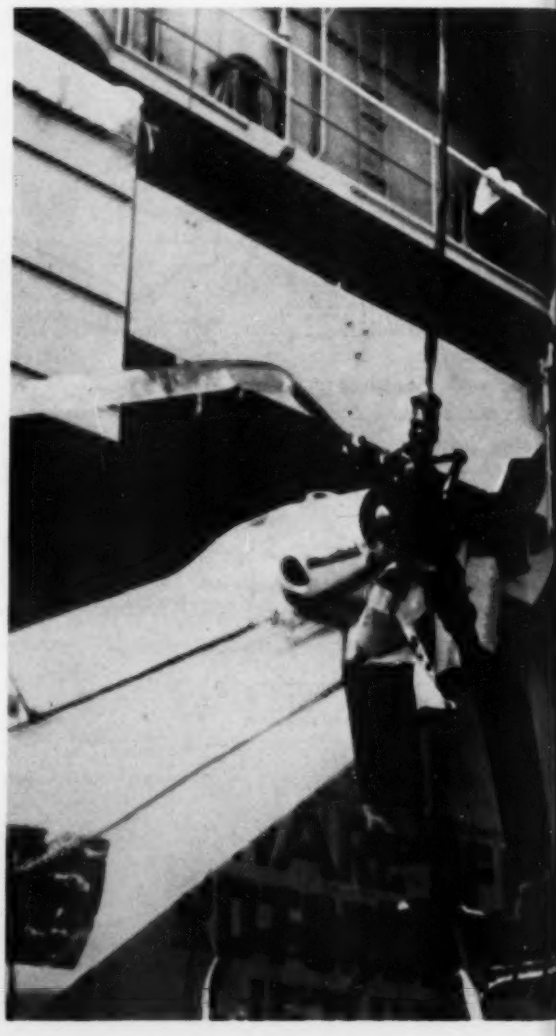
- In the interest of economy, production cycles for many FLIP products, world-wide, have been or will be expanded, i.e., U.S. Terminal High Altitude Procedures are now published every 56 days vice every 28 days. Users are requested to check expiration dates closely and to care for the publications wisely in order to make them last throughout the expanded periods.

# Dum De Dumb Dumb

THERE is only a very fine line to distinguish the difference between a well trained, seasoned, safety conscious flight deck crew and a well trained, seasoned, complacent flight deck crew. The former exerts every effort to comply with SOP under all conditions; the latter usually complies with SOP under most conditions.

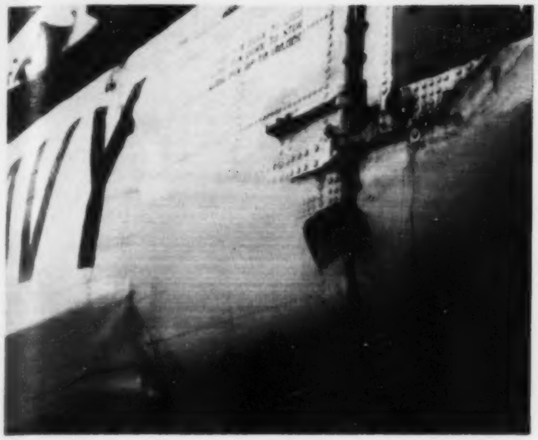
**Sequence of Events**

At 0745 an SH-3 was brought up from the hangar bay and positioned on the flight deck abeam the forward part of the island to be the Condition 3 aircraft. The helicopter was spotted nose forward, rotor blades folded, blade restraining straps attached, tail pylon folded and the tail rotor gust lock removed in anticipation of spreading the tail pylon. The aircraft was chocked and secured with a four-point tie-down. No flight operations were planned for any of the carrier's aircraft except to launch the ready duty plane guard helo for an inbound COD. At 0830 a C-2 was recovered and parked on the starboard catapult in preparation for an 0915 launch. The helicopter was 127 feet aft of the C-2. When the C-2 went to full power the propwash caused the tail rotor blades to begin windmilling, slowly at first and then faster; suddenly the tail pylon snapped violently from the folded to the spread position and the spinning tail rotor blades became enmeshed in the structure of a forklift parked aft of the helicopter. The helo received damages estimated at about $120,000. The photographs show damage to the tail rotor blades, tail pylon hinges and buckled fuselage.



**Investigation**

The aircraft accident board pointed out that the ship's instruction requires spreading the tail pylon on the hangar deck whenever possible but that space limitations often do not permit this until the helicopter is on the elevator on the way to the flight deck. The same instruction also charges aircraft handling personnel with the responsibility to ensure that all personnel are clear of aircraft jet blast or propwash and to ensure that aircraft on the catapult will not be turned up until the area behind has been cleared for a safe distance. After the C-2 had been recovered it was expected that the helicopter would be moved to a spot aft of the island. It wasn't



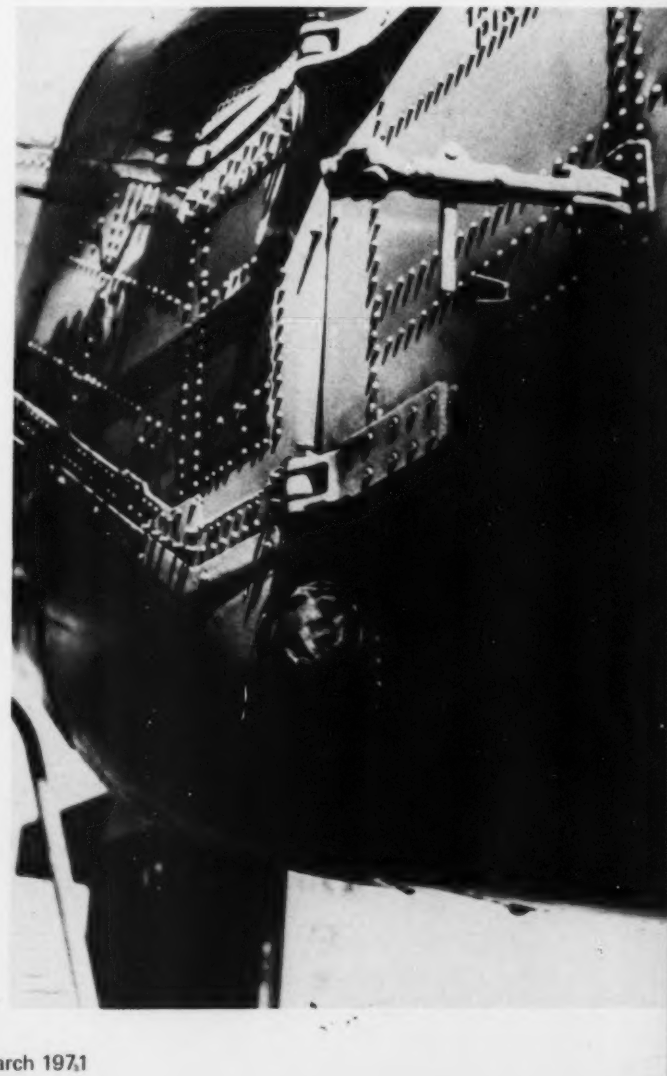
moved. So the stage was set for the accident which subsequently occurred. The aircraft accident board recommended that aircraft handling personnel as well as air group and squadron personnel be reminded of the inherent dangers in spotting helicopters behind any fixed-wing aircraft. It is assumed that the board meant helicopters parked with tail pylons folded behind fixed-wing aircraft which are turning up. An endorser commented on the tempo of shipboard operations as a factor in aircraft accidents but did not infer that it played any part in this accident. Another endorser commented on the ship's aircraft handling personnel and squadron supervisory personnel not being alert to the hazard of the C-2 propwash (after the accident a hand-held annemometer registered winds of 55 knots behind a C-2 at the helicopter's location) and recommended discontinuance of spotting helicopters abeam the forward section of the island when a C-2 is on the starboard catapult. Another endorser commented that this accident, like most ground accidents, was caused by inattention to detail; that many persons in supervisory capacities failed to be alert; and that there is no excuse for noncompliance with standard operating procedures.

### Shipboard Operations

Standard operating procedures have been developed, sometimes at the cost of lives and aircraft, in order to prevent just such an accident. Squadrons and ships go through training cycles so that teamwork can be developed and operations under pressure can be conducted safely and with dispatch when required. It follows then that routine operations should be a piece of cake. However, everyone should be alert to keep his guard up, avoid shortcuts and observe SOP whenever shipboard operations are being conducted.

A similar mishap took place within weeks of the ground accident just recounted but on another carrier. In the second mishap the helicopter was spotted on the flight deck also with the tail pylon folded. The tail rotor blade lock assembly either disengaged or failed to engage allowing the tail rotor blades to windmill. In this instance before the blades could be stopped they contacted a main rotor blade – all five tail rotor blades were damaged sufficiently to have to be discarded.

In both cases airframes change 198 had been incorporated but even with the change there seems to be insufficient reinforcement of the tail rotor locking mechanism to prevent slippage. All ships operating SH-3 aircraft are aware of this design limitation and the one best way to avoid similar mishaps is to comply with ship's instructions to spread the tail pylon on the hangar deck or on the elevator before reaching the flight deck.



This story concerns a young, inexperienced but very capable naval aviator. The reason for bringing this ordeal to your attention is to graphically illustrate how an unfortunate series of judgment errors can occur and ultimately lead to an aircraft mishap. The AAB (Aircraft Accident Board) and subsequent endorsers to their report found the pilot blameless.

# Can of Worms

LIEUTENANT Junior Grade Blank was scheduled for a night photo mission originating from the deck of USS SLINGSHOT. He thoroughly prepared for his flight which included the briefing of his assigned fighter escort. He was well rested, had eaten a proper dinner and was in all respects ready for his 1800 launch.

He launched in his RF-8G on time and headed for a rendezvous with his F-4 escort overhead the ship. The two aircraft joined and then proceeded to the target area. Upon arrival Blank flew the *Crusader* through two photo runs and then, as briefed, passed the lead to the F-4. With the mission completed the two aircraft headed back to the carrier. At 1920 Blank received his marshall instructions for an approach to commence at 1944. At 1930 approach control changed marshall time to 1945 and at the same time the DME (distance measuring equipment) in the F-8 became intermittent causing the pilot to commence his descent at 40 nm vice the assigned 37 nm. Blank started the approach on time with a fuel state of 3300 pounds. He called the ball with a fuel state of about 3000 pounds and the F-8 in a good final approach attitude but was waved off by the LSO for not having a visible approach light.

From this point on things began to get real hairy for this young pilot. In his own words, here is what happened:

"After waveoff I checked inside and found the doughnut indexer light was also inoperative, however, the fast and slow chevrons were on the line. The angle-of-attack indicator was working normally and the APC (approach power compensator) was good. On the second approach with 2600 pounds of fuel remaining I became rough on the controls, went low in the middle, corrected for it and then went over the top and boltered. At touchdown on this pass the RMI (radio magnetic indicator) froze. I attempted to reset it in both the slaved and free position after becoming airborne but it wouldn't move. Realigning the RMI was impossible so I informed approach control that I had no directional gyro and would need called turns. I arrived on the ball for the third approach with 2200 pounds of fuel on board. Again I was rough and overcontrolled all the way

down the glideslope. The LSO waved me off for poor technique. Remaining in the bolter pattern for a fourth approach I called the ball with a fuel state of 1800 pounds. This pass felt a little better but I went high in close and boltered. I then raised the gear, lowered the wing and broadcast to approach control that I was going to bingo to the divert field; my reasoning here being that another approach would take me below my bingo weight of 1600 pounds coupled with the fact that earlier in the flight approach control had stated that there was no tanker available in the area for practice plugs. Approach told me to stay at the ship and remain in the bolter pattern, that a tanker would be available in two minutes. Here I decided to make another attempt to get aboard the carrier thinking that if I boltered again I would still be close enough to bingo weight to get to the divert field and with a tanker enroute it should be no problem. I dirtied up the aircraft once again and commenced my fifth approach. Shortly after turning off the 180-degree position but prior to reaching the 90-degree position, aircraft electrical power was lost and the cockpit went dark. I added 100 percent power and looked outside to see if I could determine my attitude. There was no moon at this time but there was a faint horizon. Holding my altitude I reached for the RAT (ram air turbine) extension handle and deployed it. With my right hand I turned the emergency electrical power switch ON. The instrument lights came on and I went back on instruments, maintaining the F-8 in a shallow left turn at 600 feet altitude. There was a short delay before the radio came back on the line, after which I called and told approach control that I had a generator failure. Due to the generator failure my approach scan had broken down and I found myself high and overshooting on final. Approach control asked if I was going to continue the approach and I replied, "Negative." I told them I was below bingo weight and would require tanking. At this point I tried to raise the gear but the handle wouldn't budge. I then thought that the probe would not extend with emergency electrical power on but hit the probe switch anyway and the probe extended. I tried the landing gear switch again with no success. I called approach and told them my gear would not retract, the RMI was inoperative and that I would need a steer to the tanker. They then switched me to departure control for the rendezvous with the tanker. I departed the ship gear down, probe out, RAT out and wing down with 1300 pounds of fuel remaining. Enroute to the A-4E tanker my fuel boost pump light came on. It lit full bright and I tried to dim it with the instrument and console light rheostats but to no avail. *(The brightness of the yellow warning light cannot be dimmed when operating on emergency electrical power. – Ed.)* This bright light annoyed me and reduced my visibility outside the cockpit. I attempted to remove the bulb but it wouldn't turn.

"The *Crusader* had a fuel state of 800 pounds when rendezvous was effected with the tanker. The first few attempts to make a plug were commenced from directly aft of the A-4 but on each approach to the basket the turbulence of jet wash created by the tanker threw my aircraft around quite violently. I informed the tanker pilot of my predicament and he tried different flap settings but there was no noticeable reduction in the A-4 jet wash. The tanking was being attempted at airspeed between 190 and 195 kias in order to give me a power range to maneuver the aircraft. After several straight-in attempts to plug were unsuccessful the tanker pilot changed configuration to three-quarters flaps and I approached the basket from the starboard side in an effort to keep my aircraft out of the A-4's turbulence. However, in approaching the basket the vertical stabilizer of my airplane was caught in the A-4's jet wash causing the F-8 to yaw and roll violently. My plane was repeatedly rolled to the right reaching banked attitudes of 90 degrees and occasionally the rolling motion was severe enough to force my aircraft above the tanker. Shortly after the pilot of the F-4 escort flying with us had called out my distance from the divert field to be 40 nm, the main fuel gage read zero and the engine flamed out. I was still trying to plug the tanker at this time. As my aircraft moved aft of the A-4 I lowered my nose attitude slightly and told the tanker and escort pilots that I was going to eject."

We won't go into a long dissertation on the ejection phase of this mishap. The pilot performed all of his ejection sequences properly and through the excellent use of his strobe light and pencil flares, while in his raft, a successful helicopter pickup was accomplished some 50 minutes after ejection. No injury was incurred.

Three cause factors were assigned to this mishap by the aircraft accident board; material failure, supervisory and facilities. The insidious combination of these factors resulted in the accident in such a way that it was extremely difficult, if not impossible, to identify one primary cause. However, without the material (generator) failure it is highly unlikely that the mishap would have occurred. Nonetheless, had supervisory and facilities personnel done their jobs properly before, during and after the generator failure the F-8 probably could have landed safely.

**Supervisory**

Lieutenant Junior Grade Blank had completed the flight training program, RAG (replacement air group) training, carrier qualification and RF-8G operational photo training in a highly professional manner. He had

demonstrated a marked proficiency in flying the F-8 aircraft in all phases of its mission. It was noted by the AAB that three factors contributed to the accident in the supervisory area; one in qualification, one in proficiency and one in failure to comply with established operating procedures. These factors are discussed below:

- Prior to the mishap 21 days had elapsed since LTJG Blank made his last night carrier landing and 23 days since a day carrier landing. During this period he had flown only four sorties. The most recent was seven days prior to the accident.
- The LSO NATOPS manual establishes recommended scheduling policies when considering pilot proficiency. These recommendations were not followed even though the flight schedule indicated that they could have been.
- The overhead tanker scheduled for the 1945 recovery was an A-4E. LTJG Blank had never refueled from this model aircraft and had never attempted night tanking from any type aircraft. His entire tanking experience consisted of four day plugs, the last occurring four weeks before the mishap. In addition, he had not tanked with his aircraft in a wheels down configuration.
- The air wing policy required each unit to provide an observer in CCA to monitor all recoveries. In this case an observer had been scheduled but was not present in CCA for the recovery. As a result air operations was not informed that LTJG Blank was not proficient in night carrier landings or air refueling.

**Facilities**

There were several errors in judgment made by the operators of the facilities in this mishap. The events and lack of communications which led to these errors are described below: *(The call sign Filter 222 will be used when referring to LTJG Blank in the RF-8G. – Ed.)*

- The accident occurred on the first night of operations for this at-sea period. The last full day of flight operations had taken place 20 days earlier.
- CCA (carrier controlled approach) was not using a bingo fuel state but had one A-4E stationed above the bolter pattern to tank low state aircraft and return them to the bolter pattern. This was the first period that A-4s were used as tankers. CCA was briefed to tank F-4s at 2000 pounds but was not briefed on minimum tanking fuel states for other type aircraft.
- At the time Filter 222 commenced his fourth pass CCA had him and two other aircraft, an A-4 and F-4, approaching low state. The A-4 trapped but the F-4 boltered. His state was 2000 pounds – 600 pounds below bingo. The F-4 was given a bingo and the tanker was instructed by departure control to refuel the F-4 enroute to the divert field which was 90 miles distant. Following this, Filter 222 boltered and requested a bingo. His state was 1650 pounds – 150 pounds above bingo. The CCA officer, unaware of the divert, planned to refuel 222 so he told Approach to keep him in the pattern. A short time later the CCA officer was informed that the F-4 tanking would be completed in about two minutes. Still unaware that the tanker was accompanying the F-4 on a bingo, Approach called Filter 222 who was then at the abeam position and advised him of a two-minute delay in tanking. He elected to continue the pass with a fuel state of 1400 pounds.
- When Filter 222 reported the generator failure to Approach he informed them that he could not bingo with his present fuel state and the gear would not retract. He was instructed to switch to Departure for tanking. The AAB estimated his present state to be between 1200 and 1300 pounds. Filter 222 headed for the tanker which was then 30 miles from the ship. Rendezvous was effected with the A-4 about 18 miles northeast of the ship. *Ten whole minutes* had elapsed since Filter 222 had requested a bingo and the F-8 was down to 800 pounds of fuel.
- The CCA and air operations supervisors had very little information available to evaluate this emergency. When the generator failure was reported it was recorded on the status board as an instrument failure. The information that the gear would not retract was missing and the location of the overhead tanker was unknown. None of the supervisors knew that the gear was down and that the aircraft could not reach the divert field without refueling. It was rather apparent that no one in CCA monitoring Approach and Departure had a real appreciation for the emergency in progress.
- Some additional confusion seems to have been caused by unfamiliarity with A-4 tankers. A considerably longer time was required to tank using the A-4 than was anticipated.

There you have it. All of the facts, described in detail, which involved this aircraft mishap. There is little doubt that the three causal factors assigned by the AAB were correct. This pilot should not have been scheduled for a night photo flight without a night carrier requal. Night aerial refueling would have been out of the question had an observer been present in CCA to advise the supervisors that LTJG Blank was not proficient in this area. Had the generator failure not occurred the pilot would have been trapped aboard USS SLINGSHOT. If air ops had known the whereabouts of the tanker, chances are the F-8 pilot would have been allowed to bingo when he made his request. Unfortunately things were unfavorable to the pilot throughout the ordeal and, as a result, the Navy is minus one RF-8G. ◄

*An article, To Report Or Not To Report, appeared in the September 1970 issue of APPROACH and discussed the problem of handling marginal performance of pilots and the responsibility of HACs (helicopter aircraft commanders), any aircraft commander or instructor pilots when another pilot exhibits dangerous flight habits. The following article is reproduced from the October 1970 issue of Collective Pitch, published by MAG-56, and not only gives some insight from the vantage point of the commanding officer but also brings out several important points on the relationship between officer responsibilities and aviator performance.*

# Officer

By LCOL Richard G. Courtney
Commanding Officer, HMM-265

A SQUADRON commander has relatively little opportunity to evaluate the airborne performance of his pilots compared to ground performance. He can review the results of NATOPS evaluations and other check flights, look at examination grades, examine the logbooks of his pilots, and still not know enough about the true caliber of the people flying for him. It is difficult for him to elicit honest criticism of any of his pilots from other pilots, unless a gross lack of proficiency exists. What, then, can he use as criteria when judging the airborne performance of his pilots?

As a matter of fact, our aircraft commanders generally fly with each other only on evaluation flights. They know each other well enough on the ground, but see one another only on "best behavior" in the air. An objective, realistic evaluation of one's contemporaries is as difficult for the average HAC as it is for the squadron commander.

Take a look around and make an "educated guess" as to the proficiency of your fellow pilots in the air. Chances are, you're basing that guess on information which has little to do with airborne observation. We tend to evaluate a man's professionalism in the air by observing his professionalism on the ground. The squared-away, knowledgeable, rational Marine officer is unlikely to be a sloppy, ignorant, or careless naval aviator. Why? Because there's little chance that professionalism is a "sham" – an act put on for the benefit of observers. Professionalism as an officer first and as an aviator second becomes a way of life.

Since we validly consider a lack of professionalism to

contribute to accident potential, a consistent chain of logic could lead one to believe that the safest *pilot* is the most squared-away *officer*. Though that conclusion might not be entirely true all of the time, it is hard to refute as a general rule. Specific instances show that professionalism on the ground *can* reduce accident potential.

The pilot who, on arrival for RON after a long cross-country, first *ensures* that his crew(s) are properly billeted, have food available, and are briefed as to their responsibilities the following morning, obviously reduces the chance of frustration and misunderstanding which might contribute to a mishap. The officer/pilot who *knows* his crew is more likely to get maximum performance from each member. Each crew chief has a

# First!

name, yet many pilots routinely come up on the ICS with "Hey, crew chief . . . " The pilot who knows his crewmembers, and the capabilities of each, is likely to demonstrate the same sort of professionalism on the ground while performing his administrative duties.

The officer who leaves his desk without advising his NCOIC as to his destination, ETR, and phone number is just as likely to "forget" to brief his crew prior to flight.

How does this affect the crewmembers? If not briefed, if the pilot doesn't even know the names of the men he's flying with, how can the crew chief *feel* necessary to safe completion of the flight? Anyone who has heard "Aircraft at four o'clock level, closing," or "There is fluid leaking from the aft transmission" *knows* that there is more to a flight crew than pilot and copilot.

The professional officer can tell you the name, marital status, and personal situation of each man he has working with him. He knows about Corporal Martin's letter of indebtedness and Sergeant Smith's new baby girl. He's working to get LCpl Jones to request OCS and PFC Brown to take a particular MCI course. He knows the last C&P marks recorded for each of his men, and is aware of the eligibility for promotion of each. He will perform his flight administrative duties and assigned ground duties with the same zeal and attention to details as he performs his flight duties. His appearance will never be sloppy and his attitude will always be constructive.

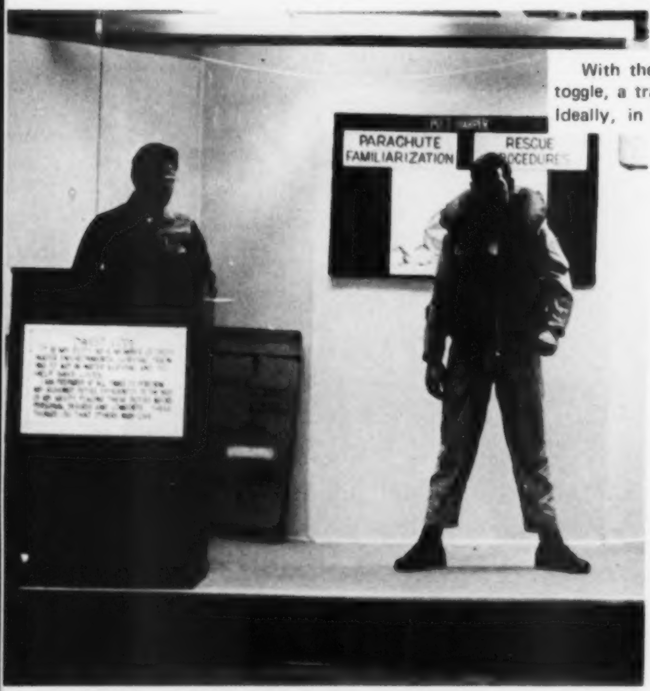
There's a feeling among many supervisors that to find out who consistently performs well in the air, one need only ask the crew chiefs. They may have the utmost respect for you as a naval aviator, but what do they think of you as an officer?

A trainee demonstrates an LR-1 (one-man liferaft).


By LCDR E. A. Wilson
FAETUPAC DWEST Training Officer

# Life Ensurance






With the collar lobe of the LPA-1 life preserver already inflated by the right toggle, a trainee prepares to pull the left toggle which inflates the waist lobes. Ideally, in a survival situation both toggles should be pulled simultaneously.

MOST naval aviators are aware of the requirements for life insurance on their own lives. However, many seem either unaware of or reluctant to avail themselves of the vital training which will provide the knowledge to cope with survival situations and thus *preserve* their lives. The name of the game is life ensurance and to Pacific fleet aviators and aircrewmen, life ensurance is spelled DWEST, the acronym for Deep Water Environmental Survival Training.

In late 1965, FAETUPAC was tasked with establishing a realistic and updated water survival course for all flight personnel. Prior investigations had revealed that in some cases of attempted rescue the victims were found dead in the water mainly due to a lack of understanding of equipment provided them.

The first DWEST class, consisting of 22 students, was conducted on 21 November 1966. Since that time approximately 11,000 students have undergone this


valuable training. Presently classes are conducted twice each week.

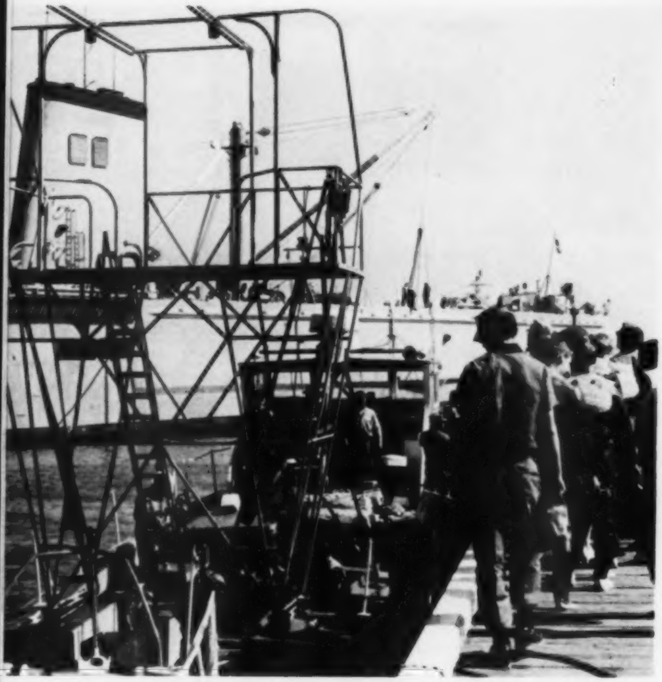
The course takes one full day with the morning devoted to lectures covering various types of equipment students might encounter. Students are encouraged to examine and handle all the various items during this time.

DWEST teaches that the best remedy to any survival situation is prompt rescue, regardless of whether wartime conditions exist or not. To facilitate achieving this end students are taught procedures to utilize from ejection to rescue.

Classroom instruction covers proper methods for donning and using such survival equipment as the MA-2 integrated torso harness in conjunction with either the Mk-3C or LPA-1 life preservers. Use and capabilities of the mae west are also covered along with the use and limitations of the Mk-5A and QD-1 (quick-donning) anti-exposure suits and the new ventilated wet suit type anti-exposure suit.

Of primary importance to a survivor who has just successfully left his crippled aircraft is the situation he is now faced with, i.e., the parachute descent. DWEST instructors teach proper usage of military parachutes

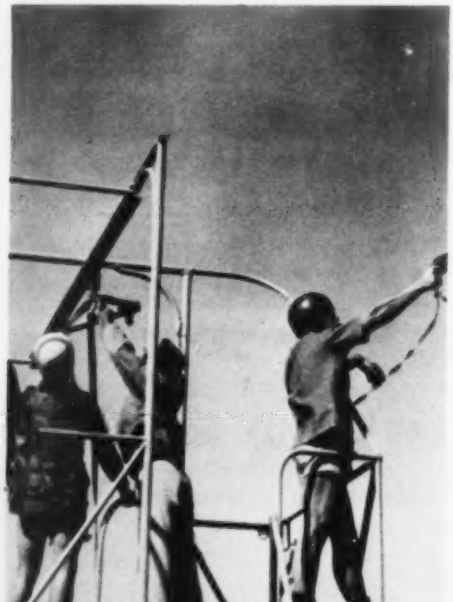
A "survivor" demonstrates an immobile rescue on the three-pronged Boyd seat. Another hoist device is the Billy Pugh rescue net shown in the photo to the right above.



For the deep water phase of training, DWEST trainees prepare to board a modified AVR equipped with a jump tower.

Here's how it looks from the tower platform.





An instructor demonstrates signaling with a .38 cal. revolver.

during descent as well as how to best land in water. Students are also taught the best methods of parachute release in calm sea/wind conditions as well as in high wind conditions.

Next in the progression of knowledge transfer comes instruction and classroom demonstrations of the final pieces in the puzzle – rescue equipment! Students are taught the correct use and capabilities of such rescue devices as the rescue sling (horse collar), rescue seat, Billy Pugh rescue net and jungle penetrator (although this last piece of gear is rarely used for water rescues). The two-pronged rescue hook is also explained and demonstrated.

DWEST also teaches that communication is of paramount importance in effecting any rescue. Students are taught proper use of survival radios, signaling mirrors, whistles, flares and lights. Additionally, procedures for improvising simple, yet effective signaling devices are explained.

The afternoon is spent at sea conducting operations from a 63-foot AVR. Students are "dropped" from a tower on the aft end of the boat some 14 feet into the cold Pacific water. The tower is equipped with rails from which students are suspended by a quick release mechanism. Use of the quick release allows an added degree of realism since the "parachutist" does not know

A trainee is towed on his face at a forward speed simulating conditions encountered in a 20-knot wind.



"Survivors" must paddle their rafts to a buoy.

exactly when he will hit. After the drop the students are towed at a forward speed which closely simulates conditions encountered in a 20-knot wind. During the time involved in the drag the students must turn over onto their faces and then turn on their backs. This procedure shows how to position the body for maximum safety and comfort while being towed.

After successful release from the tow harness the students spend a period of time in a liferaft (the type normally found in the aircraft they fly). They are required to "row" their rafts to a buoy and attach a snap line. While enroute to the buoy the "survivors" fire a Mk-79 pen gun and both ends of a Mk-13 Mod 0 flare. Other pyrotechnics, such as the various signal flares used in the .38 caliber service revolver, are demonstrated by instructors.

The day's training is topped off by an actual helicopter pickup of each student using a horse collar. This pickup is preceded by a demonstration D-ring pickup of an instructor. All students are outfitted with as much of the equipment as possible that they would normally use in the aircraft they fly. The corrosive effects of repeated and prolonged exposure to salt water and salt air greatly reduce the life of all the gear used. Thus, some gear is simulated, such as football helmets vice hardhats.



After the short ride back to the airfield in the helo and a truck ride to the training building for hot showers and a brief critique, the students' day is complete. The DWEST graduates then return to their commands with the confidence, gained through experience, that they will be able to survive should they be confronted with a deep water survival situation.

Above, a pair of "survivors" wait in the water for helo pickup. In the photo on the right, both men are about to be hoisted simultaneously.

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# Dive for the Deck

A CASE I recovery was in progress on board a CVA. The weather was VFR, wind direction and velocity were at, or near, ideal recovery conditions and the Fresnel Lens was set for the A-7.

An A-7E pilot commenced a day VFR approach, APC (automatic power compensator) engaged and was well within approach parameters until the in-close position when the aircraft started a slight left drift. The LSO called for a little right lineup and the pilot started to correct to the right. However, he also made a rapid nose-up correction. At this point the LSO believed the pilot had initiated his own waveoff since the magnitude of the correction was not compatible with the aircraft's position on the glideslope. As the aircraft passed over the ramp with approximately 17-18 feet of hook to ramp clearance the pilot made a rapid nose-down correction. The APC took power off the aircraft and the aircraft settled rapidly. Just prior to touchdown the pilot made a large nose-up correction, overrotated and touched down on both main gear in an extreme nose-up attitude, engaging the No. 3 crossdeck pendant and skagging the tail cone and belly pan. As a result, the underside of the tail cone was scratched and buckled and the aircraft's belly pan was scraped and torn.

The LSO's comments on the pass were: "Cut pass (unsafe); pull nose up off late lineup, high at ramp, drop nose to land, pull nose up over the wires."

The pilot was well within approach parameters until the aircraft was in-close at which time a small lineup correction was needed. The LSO interpreted the rapid nose-up correction as a pilot initiated waveoff but when the nose of the aircraft came down again (APC reducing power) the aircraft had already passed through the "waveoff window" and a safe waveoff was no longer possible. The cause of the incident was directly attributable to pilot judgment in not waving off his own approach after placing the aircraft in a nose-high climbing attitude at the ramp and the LSO's failure to call for waveoff immediately when he observed the aircraft go high at the ramp. The squadron commanding officer made this comment:

"The pilot obviously made too great a nose-up correction as he approached the ramp and should have initiated his own waveoff at that time. Instead, he dropped his nose and made a classic play for the deck. Because the approach was made with the APC engaged,




the subsequent nose-down correction aggravated the situation by reducing power and further increasing his sink rate. When the pilot realized that his sink rate was far too excessive, he should have put full power on the aircraft and held his attitude. Instead, he pulled the nose up sharply to add power via the APC, and overrotated in the process.

"The LSO should have initiated a waveoff call immediately when he saw the aircraft start an excessive climb in close. Instead the LSO assumed the pilot would initiate his own waveoff. A waveoff call from the LSO at this time would have kept the pilot from changing his mind at the last minute and compelled the pilot to break out of APC and put full power on the aircraft.

"All pilots in this squadron have been rebriefed on glideslope technique, with particular emphasis on APC techniques and how they affect aircraft performance at the in-close and at-ramp positions. LSOs have been reminded that they must never relax their standards of performance regardless of pilot experience or demonstrated boarding efficiency."

## Poison-Proof Your Home

NATIONAL this-that-and-the-other weeks have proliferated until we have lost count of them. One, however, at the top of our list is National Poison Prevention Week, observed annually during the third week in March.

According to National Safety Council statistics, there were 2000 accidental deaths in the home by poisoning in 1969, up 5 percent over the preceding year.* In 1969, poisoning was the fifth most frequent cause for deaths of children age one to to four, following motor vehicle accidents, fires and burns, drowning and falls, in that order. An estimated 500,000 children, 90 percent of them under age five, will be victims of nonfatal accidental poisoning this year.

Approximately half of all accidental ingestions of poisonous materials by children reported to the Public Health Service involve internal medications. Half of these accidents involve aspirin. *Aspirin should be kept out of sight and out of reach of children even if the bottle has a safety cap.* Considering the agility, mobility and ingenuity of the average child, a safety cap on a medicine bottle should never lull parents into false security. Other substances responsible for child poisoning are cleaners, kerosene, lighter fluid, furniture polishes and waxes, toilet bowl and drain cleaners, pesticides, insecticides and disinfectants.

Of all the rooms in the house the kitchen is the most dangerous when it comes to poisonings. Approximately one-third of all poisoning accidents occur in the kitchen. In almost two-thirds of all kitchen accidents, substances involved were not in their customary storage places. In more than one-fourth of these accidents the substances involved were not in their original containers. *(Please see "Home Accident Causes Burns of Throat," page 34, February 1970 APPROACH. – Ed.)*

All products should be kept in their original containers and foods and household products should be kept separate. Cups or soft-drink bottles should never be used for such materials as paint thinner, turpentine or gasoline. Naturally enough, children tend to associate cups, soft-drink bottles and drinking glasses with food and drink. Several fatalities have been reported in which charcoal lighter fluid used to start outdoor barbecue fires was poured into just such containers and accidentally drunk.

Another point to remember is that poisoning accidents are not always related to ingestion. Poisoning can result from inhalation or absorption of toxic substances through the skin. When using an item such as a pesticide, insecticide or cleaning solvent, read the label carefully, use the product only for its intended purpose and follow directions.

Here are some brief pointers on how to poison-proof your home:

- Keep household products and medicines out of reach and out of sight of children, preferably in a locked cabinet or closet. Even if you must leave the room for only an instant, remove the container to a safe spot. Return medicines to a safe place immediately after use.
- Store medicines separately from other household products and keep these items in their original containers – never in cups or soft-drink bottles.
- Be sure that all products are properly labelled and read the label before using.
- Always turn the light on when giving or taking medicine.
- Since children tend to imitate adults, avoid taking medications in their presence.
- Never call medicine "candy" when administering it to a child. Refer to medicines by their proper names. If a child thinks a medicine is "candy," when left alone he may locate the bottle and eat or drink its contents.
- Clean out your medicine cabinet periodically. Get rid of old medicines by flushing them down the drain. Rinse the containers in water and then discard them.

Protect yourself and your family from accidental poisoning.

If in spite of all precautions there is a poisoning accident, get help promptly. Call a doctor, a hospital, a poison center or the police. If you must go to a doctor's office or hospital emergency room, take the poisonous substance's package or container – label intact – along with you.

* The National Safety Council includes in this figure deaths from solids and liquids (medicines as well as commonly recognized poisons) and deaths from mushrooms and shellfish. Fatalities from spoiled food, such as in cases of botulism, are not included.

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# notes from your flight surgeon

## Near Tragedy

AN AE3 had a close call a few months ago when he forgot that the oven in the gas stove in his new apartment did not have a pilot light. (The stove in the apartment he had just moved from had an automatic pilot light to light the oven when the gas was turned on.)

Following his previous habit pattern, he put a steak under the broiler and turned on the gas. Later, when his wife asked him to look at the steak, he opened the oven door and discovered he had not lit the gas. Without thinking, he got a match, leaned over and struck it. The accumulated gas ignited and flames belched from the oven. He received first and second degree burns of the face – it could have been much worse. He was treated in the emergency room of the local naval hospital and was only away from the job two days.

Investigating safety personnel warn:

- Strike your match before you turn on the gas in any gas heating/cooking equipment.
- If gas accumulates and does not ignite, ventilate the space by opening doors and windows before you try to relight.

## Reflective Tape

THE PILOT of a SAR helo trying to rescue a survivor from a sea heaving with 10-foot swells experienced disorientation induced by the helo's floodlights. He asked the crewman if he thought the pickup could be made without the light.

"His answer was yes," the pilot stated, "the lights went out and I breathed easier."

As the helo rolled on final approach to the survivor, the survivor's strobe light went out. The crewman broadcast on the loud hailer for him to turn it back on and after that the survivor was easily visible. Even with the helo's floodlights off, the pilot says, the reflective tape on the survivor's helmet showed up very well.

As a result of experience in this rescue, the detachment is attaching two small matrix lights and some reflective cloth to the rescue sling so the SAR crewman can keep it in sight without using floodlights. In addition, the SAR pilot strongly recommends that all pilots and other aircrewmen make sure that the functional use of reflective tape on their helmets takes precedence over decoration.

## Slight Cold

POST-EJECTION and rescue physical exam of a bombardier/navigator showed that he had a "smoldering aerotitis media with a red tympanic membrane," in other words, acute inflammation of the middle ear. When questioned by the investigating flight surgeon, the B/N admitted to having what he called a "slight cold" but claimed he could clear both ears prior to launch.

Aerotitis media is caused by differential pressure in relationship to the pressure in the middle ear. It can cause pain, deafness, roaring in the ears and, occasionally, vertigo. When a pilot or other aircrewman is unable to equalize the pressure in his ears, increased differential pressure can cause his eardrum to rupture.

This case, the flight surgeon says, points up the need for medical examination to make sure, before flying, that a "slight cold" is nothing more than a "slight cold." Medical examination is indicated for all "colds" prior to flight.

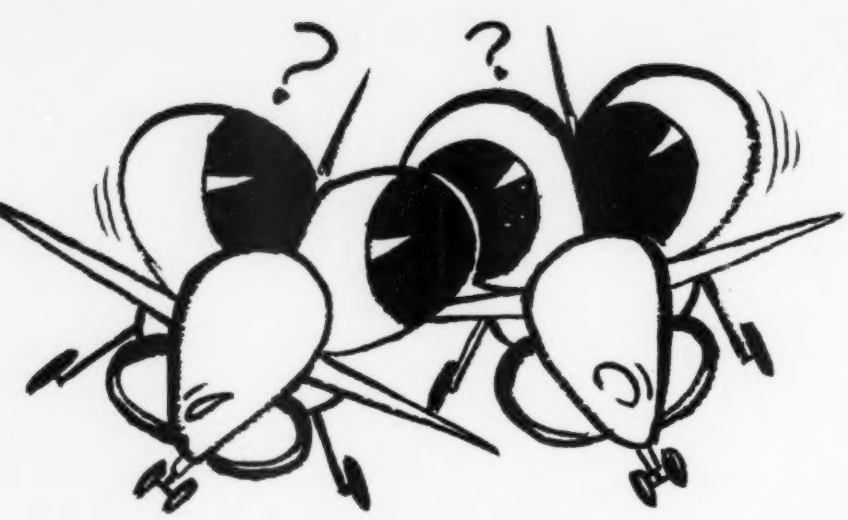
## Inattention

ON AN early morning flight a UH-1E landed at a base with guard mail to be delivered personally to a certain enlisted man. He was seen approaching the aircraft from the left rear. The crew heard a thud and felt a shudder. On investigation they found the man lying beneath the rotor blade with severe head injuries. He died shortly after arrival at a hospital.

Simple inattention was cited as the cause of the accident. Investigators found that this *same* man had performed this *same* task in the *same* place every third day for more than a month. He was characterized by his shipmates as a relatively absent-minded individual.

The arc of the rear rotor blades of a UH-1E is below the head level of the average man. The accident report recommended warning signs be placed near all locations where non-crew personnel might contact the aircraft.

Caution is the watchword around any moving prop or blade – helo or fixed wing aircraft. Make sure all the men in your squadron and in the areas where your aircraft are likely to be are aware of the dangers.



# It Pays to Plan



AN A-6 CREW (both nuggets) reported to a squadron aboard USS BOAT midway through a combat cruise. Several day hops were completed with no more than a few predictable mistakes. With a bright moon and clear sky prevailing on their first night hop, the nuggets blasted off on the wing of the Executive Officer and completed a "routine" combat hop. Enroute back to the ship, the Exec's radio slowly deteriorated and then quit. The lead was passed to the nugget pilot.

Strike and Marshall control were contacted without much difficulty and the situation was explained to the ship: The Exec would make an approach on the wing of the nugget to the meatball at which time the nugget would take a waveoff for a turnaround CCA pattern. The ship rogered and passed the information which really began to worry the nugget pilot: The weather had outguessed the weather guessers and was now a 250 foot ceiling and visibility three-fourths mile in fog. However, being possessed of the press-on spirit, he decided to give it a try.

As the approach commenced, the weather continued to slowly deteriorate to 200 feet and one-half mile. The trip downhill was accomplished with no small degree of oscillation by the nugget and a lot of hard work on the part of the Exec. At Platform, the nugget put maximum effort and concentration into flying smooth instruments and things began to look a little rosier to the Executive Officer.

So great was the nugget's concentration on his instruments that the three-fourths mile call did not fully register. Approaching one-half mile, the CCA controller called "At minimums," and the nugget took a peek out front. With nothing but blackness in evidence, he froze for an instant, went back to his instruments, *and continued to descend!*

The LSO saw aircraft lights at this time and called for "a little power." He then realized he was looking at two aircraft instead of one (he had expected the lead aircraft to waveoff at minimums). In the meantime the Exec had spotted the lens, with the ball low and sinking. Adding power, he hesitated a moment as he saw the nugget sliding below and under him.

The waveoff lights were activated, the two LSOs screamed, "Waveoff, waveoff!" and all occupants on the LSO platform dove for the deck. The pair of A-6s, now below flight deck level, waved off, Exec to starboard and nugget to port. Back on top of the overcast, the two aircraft proceeded

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

**REPORT AN INCIDENT, PREVENT AN ACCIDENT**

independently to NAS Divert, followed closely by the three remaining aircraft of the recovery.

*Recommendations:*

- The CRAW squadrons must impress upon replacement pilots the special considerations involved in a night section approach with no radio. Thorough briefings and actual flights with simulated loss of radios under VFR conditions is the only way to prepare for the real thing.
- New-to-the-fleet pilots should take a realistic attitude toward their own limitations and those of the approach equipment being utilized as well as the existing weather and environment.

LSO Anymouse

*These are valid recommendations, but they don't go far enough. We would add that ship and squadron supervisory personnel must take the lead in insuring that new pilots are not led (or allowed to proceed) into situations which are unduly hazardous. This means that each flight must be preceded with a brief thorough enough to cover all predictable eventualities. It's true that the weather cannot be guessed all the time; therefore, the brief should include specific alternative action to be taken if the weather unexpectedly deteriorates. A new-to-the-fleet pilot might be expected to hack an individual approach to minimums but to add the responsibility for executing a smooth lead, waving off at minimums and flying a turnaround CCA, during weather conditions as low as 250 and three-fourths mile – following a combat mission on his first night flight – is asking a heckuva lot. To sum up, increased training by CRAW squadrons can do a lot but supervisory personnel on the ship and in the squadron can prevent situations such as this from developing.*

## Stoof Drivers Beware

YOU would think after the length of time that the S-2 has been around that just about everything out of the ordinary that could happen has happened. However, here's one we haven't heard before.

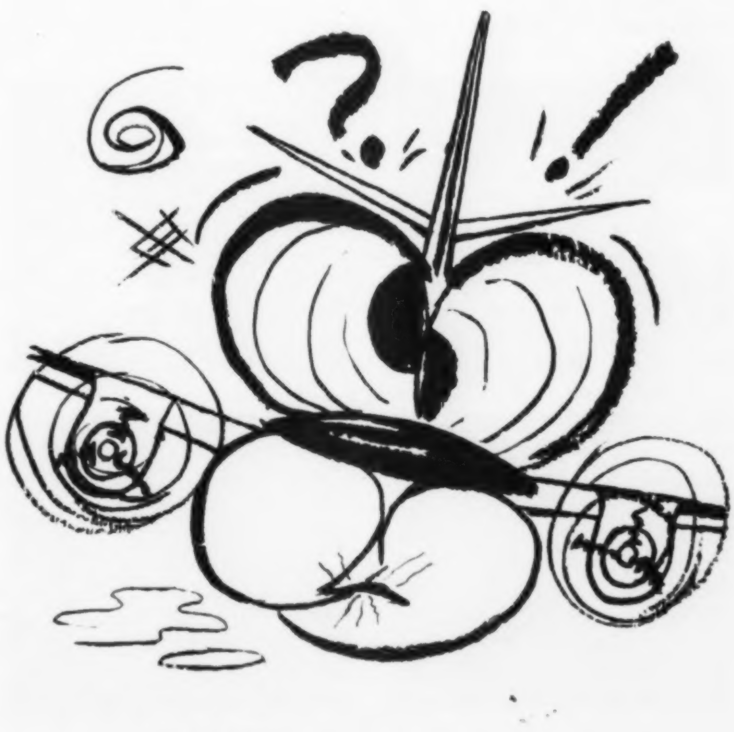
We were out over water on a routine training ASWEX cruising at 1500 feet when the pilot's pantleg caught on the autopilot switch and inadvertently turned it ON. At this time a serious control problem developed. The pilots did not realize at first what the cause of the problem was. They reviewed their emergency procedures, checked the altitude and heading switches OFF but didn't see the autopilot switch ON. After several minutes of continuous checking and with the pucker factor climbing the copilot discovered the autopilot switch ON. End of problem.

We submit that there might have been a different ending if we had been in a night MAD trap and to avoid this in the future we recommend 1) a guard for the autopilot switch or if the autopilot is malfunctioning and is not to be used that 2) the autopilot be disconnected.

Bisbby and Scott
VS-73

*There is much food for thought in your Anymouse and we believe you two have made sound recommendations. NAVSAFECEN analysts advise that this should not be a problem in the US-2 and C-1 series since the autopilot switch can be turned ON but not affect the controls until the engage button is punched. In the S-2D/E series (it's assumed you were in one of these) however, there is a built-in booby trap and a formal recommendation may be made. How 'bout it S-2D/E operators, have any of you encountered this problem?*





# 'There I was, flat on my back at

ck at 40,000 feet. . .'

## The Case for More and Better

# Hangar Flying

HALF A DOZEN pilots lounged around the carrier readyroom. Over in the corner, two of them were occupied with a gin rummy game and up front, three or four more young pilots were discussing the recovery which had taken place an hour or so earlier.

Bob Smith, a nugget, was bemoaning the fact that he had boltered twice during the recovery before trapping on the third pass. "If I had played it cool," he noted with mock seriousness, "and made one more bolter, I would have been sent to the beach. I could be sitting in the club at Barbers' Point this minute having a cool one instead of being here with you guys."

Al McCloy, another nugget, spoke up: "Sorry you missed out on the drink. I can't help you there but if you want to cut out the unnecessary bolters, maybe I can help you. Why don't you do what I do . . . when you're on short final, put in a little nose-down trim. This makes the nose a little heavy and keeps you from floating over the top to a bolter. That's what I do and I haven't had but one bolter during the last six months."

This is an entirely fictitious story up to this point. There is no Al McCloy but there *is* a naval aviator somewhere who once held the mistaken belief that the way to prevent bolters was to trim his A-4E nose-down during the final approach. It's too bad that he never ran this theory up the flagpole to see who would salute it. Had he done so, there is a good chance that his contemporaries would have pointed out some of the potential hazards in this procedure. As it was, he kept this bit of personal expertise to himself and as a result, got educated the hard way.

This pilot launched from a CVA in an A-4E one morning for an air combat maneuvering hop and upon completion of the mission returned to the ship for a VFR recovery. During the approach, he touched down past the No. 4 crossdeck pendant and boltered. The aircraft continued rolling down the angle deck in a left to right drift. The aircraft left the flight deck at the intersection of the angle and axial deck in a nose-down attitude. It then settled well below the flight deck level and about three seconds passed before a climbout was initiated. Power and rotation calls were transmitted by both the LSO and the Air Boss as the aircraft first began to settle. The situation looked so critical that a "plane in the water" distress signal was initiated as the aircraft disappeared below the flight deck level. This alarm was "belayed," however, as the aircraft quickly reappeared in a climbing attitude.

As the pilot commenced a turn downwind, the Assistant Air Boss came up on the radio and asked him if he was okay. The pilot replied that he was fine. The Air Boss then instructed the pilot to make a low pass by the ship for a visual check of the aircraft. This was considered necessary because of the possibility that the aircraft had contacted the catwalk and/or the water during the bolter. During the first pass, the aircraft was too high for an adequate visual check so the pilot was instructed to make another observation pass. During these two passes there was no visual evidence of any aircraft damage. The pilot was then cleared for another approach.

On the second landing approach the aircraft again touched down slightly past the No. 4 wire and boltered. As it rolled down the angle deck the LSO immediately began "power" calls. The aircraft was on centerline and as it left the angle deck, it once again began to settle and the right wing dropped about 10 degrees, followed by a left wing drop of about five degrees. As the aircraft reached a near wings-level, slightly nose-up attitude, the pilot ejected. The ejection was successful and the pilot was quickly rescued from the water by a helicopter. The aircraft nosed down and impacted the water about two seconds after the ejection.

During the investigation of this accident, the pilot

informed the Board on several occasions that over a period of time it had become his practice to trim the aircraft to a "slightly nose heavy" condition to preclude the possibility of "floating over the top" to a bolter. In describing his thoughts and observations during the two bolters the pilot repeatedly commented on the "nose heavy" condition of the aircraft and the fact that full back stick pressure was applied. Significantly, the pilot stated that even though he required a "little back stick pressure" on the second landing approach, he still added a "click of down trim" while on the glide slope.

The Board compared photographs of the aircraft's horizontal stabilizer (taken during the bolter) with photographs of static aircraft at various trim settings and concluded that the aircraft had been trimmed for only two to three degrees of nose-up trim instead of the six to seven degrees of nose-up trim which would normally be required for that configuration.

The LSO, when interviewed, stated that there was a "cut on touchdown" on both passes, even though the pilot felt that he had added full power immediately after each touchdown. In this connection, an endorser to the AAR commented:

"The aircraft accident board concluded that trim was the primary cause of the accident. Poor power management, however, is an equally important consideration. Witnesses in a position to judge power on the aircraft stated they observed little or no initial power application on either bolter. Yet, as observed by witnesses and recorded on PLAT tape, there was sufficient power applied to 'climb out of the hole' after the first bolter and to maintain flight deck level after an initial settle off the second bolter. Had it been only trim which caused the aircraft to settle, it is doubtful that recovery could have been effected with stick movement alone. Therefore, it is considered that the primary cause of this accident was poor power management in combination with insufficient trim rather than insufficient trim alone."

Regardless, the pilot's ill-advised habit of making his final approaches with excessive nose-down trim in order to preclude bolters appears to have been a critical factor in this accident. It's too bad that someone didn't point out the hazards inherent in this procedure. But, how could they? He never let anyone know what he was doing.

This brings up an important point – the need for communication. Actually, that is what NATOPS is all about – communicating the body of naval aviation knowledge and experience among professional naval aviators. But, NATOPS will never pre-empt other forms of communication. The situation may be likened to that of a young lady reading Glamour Girl magazine. The magazine can give her a lot of tried and true tips on how to be glamorous but many of the finer points will come from some other source, e.g. the girls in the sorority or mother at home. Likewise, NATOPS can be used to communicate a lot of valuable information but there are some things which can only be learned in the real life atmosphere of an operating unit – in the fraternity.

This places a premium on communication among individual pilots, particularly those in the same squadron. One of the best ways of effecting this communication is through the medium of the AOM (All Officers Meeting). Unfortunately, the AOM does have limitations. For example:

- The period of time during which all officers can be spared for such meetings is limited.
- Much of the time available is necessarily devoted to administrative matters rather than professional matters.
- The limited amount of time which is available for professional subjects must be carefully programmed in order to cover priority safety of flight matters.
- AOMs usually take the form of presentations or lectures by one or more officers, followed by question and answer periods. This is an excellent way to cover the subjects scheduled but the atmosphere is semi-formal and generally not conducive to a wide-ranging discussion of problems which concern only one – or a few – of the officers concerned.

To sum up, the AOM serves as an important medium of communication but does not and cannot completely fill this need among pilots in an operating squadron.

Of course, there are the flight briefings. The importance of these can hardly be overestimated but obviously mission briefings have their limitations, too. A 30-minute brief in preparation for an ordnance delivery flight is hardly the time to enter into a discussion of basic air work or to bring up a question about some instrument flight procedure which is incompletely understood. Nevertheless, there is always the possibility that this information will be needed before the flight is completed.

So what's the point? In any given group of pilots there will always be some who are more knowledgeable that others on any specific subject. The point is that flight safety will be enhanced if the level of understanding of all pilots is brought up to that of the most experienced and knowledgeable pilots in the squadron. The importance of rank and experience in developing this professional know-how among pilots should not be underestimated and neither should the potential contribution of the less experienced pilots be discounted. It's quite conceivable that a recent flight school graduate (with a recent course in aerodynamics) has a better technical understanding of the forces at play

in a crosswind landing than does a veteran of 10 years in the fleet who has not cracked a basic aerodynamics book since preflight. Likewise, a nugget who has just completed two weeks at an instrument school may have the straight skinny on some new instrument flight rule which has not yet percolated down to the operating level.

So there is definite benefit to be realized in improving communication among pilots in a squadron. Without doubt, the least experienced pilots will be the primary beneficiaries but not the only ones. The more experienced pilots also stand to benefit.

How can communication be improved? In many ways; but it seems that a giant step can be taken by assigning increased importance to the ancient art of hangar flying. Any pilot who has spent an evening at the O' Club listening to a series of "There I was, flat on my back, at 40,000 feet" stories, as told by several of his buddies, may think there is enough "hangar flying" going on already. And maybe there is – of that kind. But in this business, there can never be too much of the honest straight-from-the-shoulder discussion of flying. The suggestion is that hangar flying be dressed up and endowed with a new importance and a definite objective – enhancing the professional development of naval aviators.

Now don't rush down to the readyroom and grab the first pilot you see who is junior to you and announce, "I'm going to give you a private course in ACM, or ordnance delivery or carrier landing technique, or whatever." This is much too obvious. Instead, why not first take a personal inventory by asking yourself some questions like these:

- Is there any procedure or technique connected with flying that I would like to know more about. To understand better?

- Am I employing any personal flight technique or procedure which would be beneficial if passed on to my fellow pilots? How about my practice of making a modified barrel-roll entry into the dive bombing pattern instead of the standard entry? Should I pass this on to my fellow pilots?

- Is there any piece of equipment in the aircraft I fly which I would like to know more about?

- Do I understand the operation of some system or piece of equipment better than some of my fellow pilots? Shouldn't I let them know what I know?

An so forth. It won't take much time at all before you will be armed with all sorts of conversational ammunition. And getting a conversation started about flying is no trouble at all. But, if you do have trouble, just walk into the ready room and announce:

"An aircraft stalls at the same indicated airspeed at 40,000 feet as it does at sea level," or if you prefer, "An aircraft does *not* stall at the same indicated airspeed at 40,000 feet as it does at sea level." Either way, the bull session will be off and running. Another tried and true conversation starter is to state: "An aircraft is on short final, 10 knots above stall speed, with a 20-knot headwind. What would happen if the wind were to instantaneously cease?" Actually, the only thing that might come of these discussions is a little intellectual stimulation. The practical benefit is questionable. But . . . consider the following statements and see if you don't think the authors would receive some *practical*

benefit by expressing them to fellow pilots:

- "I always land on the downwind side of the runway in a crosswind. That way I won't run off the upwind side of the runway when the aircraft tends to weathercock."
- "When I go off the cat, I always have my right hand on the stick and my left hand on the alternate ejection handle."
- "I'm going to follow the leader at close interval on takeoff so I can take movies of his takeoff."
- "I always fly with my wings slightly overlapping the leader's wings. I think it makes a better looking formation that way."
- "I leave my master arming switch on throughout the bombing pattern. That way I have one less thing to worry about when I roll in."
- "I've flown my aircraft straight up to zero airspeed many times. There's nothing to worry about as long as you take it easy on the controls."
- "Doing a 300-knot loop in a TA-4J is no sweat. I've frequently demonstrated it to my students."
- "What's wrong with making a 500-knot pass close aboard a mountain as long as you maintain adequate terrain clearance?"

These statements have all been suggested by reports received at the Naval Safety Center. Some of them involve obvious violations of NATOPS; some of them do not, but they all imply errors in judgment and/or knowledge on the part of the authors. If the authors had submitted these views to the scrutiny of their fellow pilots before adopting them it is just possible that a number of accidents could have been prevented.

If your usual way of flying cannot stand the close scrutiny of a cross-section of your fellow pilots, then there is an excellent chance that you should consider mending your ways. However, if you think you are right and others are wrong, then fight for your baby. See that your idea or procedure is bucked up the chain of command for consideration. This is particularly important when the matter involves an established NATOPS procedure. There is always the danger that we will accept a procedure without giving it much thought just because it is written in NATOPS or even because "we've always done it that way." This is not in keeping with the spirit of the NATOPS program. NATOPS is meant to be complied with but no procedure is sacrosanct if a better way can be developed – and proven. Proving it, that's the crux of the matter. Whether you are presenting an idea or procedure to your roommate, your fellow pilots or to NAVAIRSYSCOM, you must be prepared to support it with facts and information if it is to receive the consideration it deserves. You should also require that others present sufficient supporting facts and information to prove the point before you buy their idea or procedure. And it goes without saying that neither you nor your fellow pilots should adopt any procedure or practice which is in conflict with NATOPS or other standard operating procedures without first being cleared to do so by competent authority.

To sum up, every effort should be made to make full use of the knowledge and expertise which exists in every squadron in the Navy. This should not be viewed as any attempt to downgrade the importance of standard procedures, squadron training programs or instructional procedures established by the chain of command. Rather, it should be viewed as a stimulus for *refining* standard procedures and, perhaps more importantly, as a conscious effort to substantially raise the level of naval aviation expertise throughout the squadron. This requires the utmost in communication and one of the best ways we can think of to effect this communication is to talk it up at every opportunity. The art of hangar flying can be developed and used for purposes other than telling sea stories – and it should be.

Think about it. You may hold the key to successful completion of your buddy's next flight. Doesn't it make sense to pass on this important information? ◄

### FLIP Changes

EFFECTIVE with the 4 February 1971 issue of the US Enroute Low Altitude Charts, Chart L-23 has been expanded northward to provide a better presentation of the Muskegon-Detroit area. Also, effective with this issue, two new area charts have been added to Chart A 1/2. These charts provide improved presentations of the Washington D.C. and the Denver-Colorado Springs areas which had previously been shown on various charts at different scales.

Effective immediately, autovon and commercial telephone numbers will no longer be published in the Aerodrome Remarks sections of the U.S. IFR and VFR Supplements.

If you have a question concerning any phase of instrument flight for which you cannot find a satisfactory answer, send it to Commanding Officer, VA-127, NAS Lemoore, Calif. 93245, who has volunteered to do the necessary research and supply the answers.

# ON THE GLIDE SLOPE

featuring

more questions and answers most

often asked by our readers.

*Question:* The other night in the radar controlled field mirror landing pattern the controller cleared me to "cruise" one thousand five hundred. What does this mean?

*Answer:* The Flight Planning Document (Section E) defines "cruise" as a word used instead of "maintain" in an ATC clearance to indicate to a pilot that climb to or descent from the assigned *cruise* altitude may be made at his discretion and is authorization for the pilot to proceed to and make an approach at the destination airport.

*Question:* Aggie, I understand the procedures for computing "Void Time" have changed since your article in the August issue of APPROACH.

*Answer:* Void time now represents the planned total time from initial takeoff to landing at the last destination listed on the Form DD-175. The new computation which now includes planned penetrations and approaches is more meaningful – and is stated in hours and minutes vice the date time group.

*Question:* Assuming a lost communications situation and a missed approach at my destination, what is my transponder code and altitude enroute to my alternate?

*Answer:* The IFR Supplement advises pilots to exercise good judgment and not to be reluctant to use emergency action contained in flying regulations. Assuming lost communication is your only problem it is recommended that you continue squawking mode 3 code 7600 to keep ATC alerted to your radio failure and save code 7700 for when you really need it. You should proceed to your alternate by the most direct route and at the minimum enroute altitude or higher if your fuel consumption dictates. ATC will normally clear all altitudes between the destination and alternate airfields and hold those altitudes open until the location of the aircraft involved is determined.

*Question:* Am I required to read back a clearance received while airborne?

*Answer:* The NATOPS Instrument Flight Manual, Section IV, Part 4, states that a clearance received while airborne need not be read back. However, in cases where confusion may exist or if a clearance is not clearly understood, a readback or request for amplification is recommended. Also, pilots may advise delivering agencies to stand by while clearances are checked prior to acceptance.

*Question:* When cleared for an approach will I be assigned an altitude or am I cleared to the published altitude?

*Answer:* According to the Terminal Air Control Manual 7110.8A, paragraph 548, controllers must specify the initial approach altitude only when the pilot says he is unfamiliar with the penetration and approach procedures. At other times it is not necessary for the controller to specify the altitude unless there is a block of altitudes published or an altitude is assigned for traffic separation. In either case, the initial approach altitude is considered an assigned altitude and you should call leaving your previously assigned altitude.

*Question:* When cleared to descend to a lower altitude, what rate of descent should be used for a single-seat jet aircraft?

*Answer:* Regarding climbing or descending, Part 1 of the Airman's Information Manual states that if an altitude change of more than 1000 feet is required, descend or climb as rapidly as practicable to 1000 feet above or 1000 feet below the assigned altitude and then attempt to descend or climb at a rate of 500 feet per minute until the assigned altitude is reached. The Terminal Air Traffic Control Manual, paragraph 527c, states that turbojet enroute descents are based on a rate of descent of 4000 to 6000 feet per minute.

# The Little Things

AN A-4F pilot found himself in a position where his only alternatives were to either eject or shoot an ASR approach to a field where the weather was a partial obscuration, estimated 6000-foot overcast and visibility 1/8-mile varying to 3/8-mile in blowing dust. In addition, he had a 30-degree right crosswind at 32 knots, gusting to 45 knots. Before filling you in on the outcome, let's backtrack.

The flight started out routinely from Airport A to Airport B. Enroute, the pilot decided to refile for Airport C. He thereupon contacted the nearest Metro facility and requested the weather at Airport C, as well as the enroute winds. The pilot later stated he thought he requested the forecast weather at Airport C, although tapes of the radio transmissions do not substantiate such a request. In any event, Metro responded by informing the pilot that the Airport C weather was 4500 feet scattered, visibility 25 miles, temperature 70°F, surface winds from 270 degrees at 10 knots gusting to 20 knots. The altimeter was given as 29.70 and winds enroute (at altitude) as 260 degrees at 95 knots. This information was based on a sequence report which was 58 minutes old at this time, although Metro did not advise the pilot as to the time of the weather report. Metro did not give the pilot any forecast weather.

Shortly after receiving this weather report, the pilot refiled in the air for Airport C. One hundred miles from Airport C, the pilot again contacted the Center and advised them that he desired an enroute descent starting 70 miles from his destination. This was approved, however the Center failed to provide the pilot with a destination weather report prior to authorizing the enroute descent from FL 310, the pilot's cruising altitude. The pilot accepted the clearance without requesting the destination weather and began his descent from FL 310, as cleared. There were layers of clouds from 20,000 feet through 11,000 feet so the pilot never had visual contact with the ground and did not recognize that Airport C weather was other than VFR, as the enroute Metro station had reported. When the pilot reached 10,000 feet, about 30 miles from destination, he was switched to Approach Control who advised him that Airport C was below minimums and asked if he would accept an AFB about 60 miles to the north as an alternate. The pilot gave a negative reply, stating that he had only 1500 pounds of fuel. The actual weather at Airport C was not requested by the pilot nor was it given by Approach Control until about two minutes later after the pilot had descended to 7000 feet.

The pilot was under radar control at this time and as he reached 7000 feet, he was advised that Airport C measured runway visibility was 1/8 mile in blowing dust. The pilot continued his letdown and was vectored for an ASR approach to runway 22. About five miles out the pilot was cleared to descend to minimums of 377 feet AGL, with no missed approach procedures given. Reaching minimums, the pilot elected to continue to 200 feet AGL, flying the heading corrections given by Approach Control. The aircraft was on centerline with a five-degree crab to the right due to winds. About one-half mile from the end of the runway, the pilot reported strobe lights in sight. The strobes appeared off the port side of the aircraft so the pilot corrected to the left, on centerline, on speed (which was about 124 knots). Shortly thereafter, the aircraft settled and contacted the ground 530 feet short of runway 22.

The aircraft touched down on the port main mount which then struck the extreme left approach light 500 feet short of the runway. The starboard main mount and nosewheel touched down just beyond this point. As the aircraft traveled forward it struck a three-inch lip of concrete supporting the approach lights at a point 300 feet short of the runway. The nose of the aircraft bounced on this set of approach lights and as the aircraft traveled forward, the nose fell through onto the hard

surface overrun. The aircraft started a left swerve about 175 feet short of the runway and continued a gradual left swerve until it finally came to rest 15 feet off the left side of the runway, 500 feet past the approach end. The aircraft was substantially damaged but the pilot escaped injury.

During the investigation, the pilot stated that when the controller offered to divert him to the AFB 60 miles away (at the time when he was at 10,000 feet), he realized it was within range and that it had precision approach radar. He was, he said, still considering diverting to that base, even though he had given the controller a negative reply, until he heard another controller come up on the same frequency 15 seconds later and report the visibility at the AFB as one-half mile. At this time, he considered himself committed to an approach to Airport C, even though it was below minimums.

Investigators also determined that there was a suitable landing field to the east (sky clear and 15 miles visibility) within range had the pilot diverted while still at 10,000 feet. However, they calculated that the pilot would have had only 200 pounds of fuel left upon arrival.

If there is a lesson to be learned from this accident, it seems to be that any routine flight can easily turn out to be a most exacting test of a pilot's ability, judgment and preparation for flight. There was no single, gross error on the pilot's part leading to this accident. Rather, it appears that this accident occurred because of a series of "little things."

First, the pilot should have obtained the *forecast* weather for Airport C from enroute Metro. Although he later stated that he thought he had requested it, the tapes of the radio transmissions did not support this. Therefore, instead of receiving the *forecast* weather, he received a weather report which was already 58 minutes old when received.

Second, the Air Route Traffic Control Center erred in failing to provide the pilot with a weather report prior to authorizing an enroute descent (as required by Enroute Air Traffic Control Publication 7110.9A). Even so, the pilot should have requested the weather before accepting the clearance. The FLIP Planning Document requires that the pilot and controller be in agreement on the type of approach to be conducted at destination (PAR, ASR, ILS, etc.) before an enroute descent is commenced. Had this detail been attended to by the pilot (or the controller), the existing weather conditions at Airport C would probably have come to light.

Third, the pilot exhibited a certain lack of attention to his situation during the enroute descent as he approached his destination and noted he was above an overcast which was not part of the weather reported by enroute Metro. A little curiosity about this unexpected weather might have saved the day. This lack of careful attention seems to have extended for some time after his contact with Approach Control. When Approach Control advised him (while he was at 10,000 feet) that Airport C was "below minimums," he accepted and executed a further clearance to descend to 7000 feet without requesting the weather. In fact, he never did request the destination weather although Approach Control did provide it about two minutes later.

Fourth, the pilot appears to have been somewhat hasty in committing himself to an approach to a field below minimums when another alternative existed, however unappealing, without first obtaining and analyzing the complete weather picture for both Airport C and the alternate AFB. As to the "suitable field to the east," which was later determined to have been VFR at the time, it appears not to have been considered at all by the pilot.

It is easy to second-guess the judgment of the pilot after the fact. Moreover, there is no guarantee that this flight would have ended successfully even if the pilot had made a decision at this point to divert to either of these fields. However, in retrospect, it appears that a divert to either of these two fields would have been a better judgment on the part of the pilot than continuing the approach as he did.

The pilot involved in this accident is no novice. He is a veteran of more than 4200 hours of flying and 19 years as a naval aviator. His unflappability in trying circumstances was verified by his calm radio transmissions during and after the accident, by his systematic securing of the aircraft and by his advice and assistance to crash crews when they arrived on the scene. This only serves to emphasize the insidious nature of the cause factors in this accident. There weren't any gross errors but there were more than enough of the "little things." As someone once said, "Look after the pennies and the dollars will take care of themselves." This may not be quoted exactly and a paraphrase may not be exactly applicable to naval aviation but the idea is clear . . . the little things *are* important.

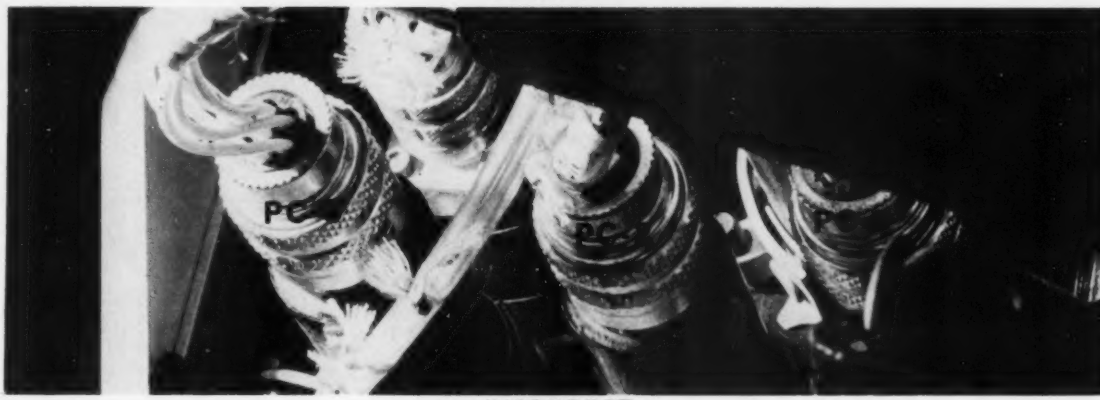
**No one gets ready for an emergency in a moment. What a person does in an emergency is determined by what he has been regularly doing for a long time.**

*National Safety Council*

# MURPHY'S LAW *

Bum Indications Lead To Wrong Evaluations

CORRECT



INCORRECT



UNDER emergency conditions, the decisions that a pilot must make in determining which procedures to use depends on full knowledge as to "what has failed." Erroneous indications can result in bad or even fatal decisions.

After 1.5 hours on a test flight, the pilot of an A-7E noted PC-1 pressure starting to fluctuate and within 5 minutes the pressure indication went to zero. He made an uneventful landing and the aircraft was turned over to the maintenance troubleshooters.

Investigation revealed the pressure loss was caused by a crack in a brazed fitting on a line assembly identified as P/N 218-42483-18, as shown in NA01-45AAE-4-10, figure 10-17, item 46. This particular line assembly is located in the PC-3 system vice the PC-1 system. Further troubleshooting revealed that PC-3 pressure was being read from the PC-1 gage and PC-1 pressure on the PC-3 gage. The cannon plugs had been reversed and attached to the wrong gages. Cause of the cracked fitting is unknown; records reveal that no squadron maintenance was performed in the area of PC gages since the aircraft had been accepted. The aircraft had flown 143 hours with this condition undetected. Upper photo shows the correct hookup, while lower photo shows the incorrect installation. ◄

*If an aircraft part can be installed incorrectly, someone will install it that way.

# LETTERS

Success is often achieved by those who do not know that failure is inevitable.

Coco Chanel

## More About Whistlemouse

*FPO, San Francisco* – In reference to the August 1970 article, "Airspeed, Vertical Speed Indicator, and Whistle" . . . . Wow! Was this guy lucky! I can imagine about 200 young chargers reading this article and incorporating this new "emergency procedure" into their repertory. The editorial comment that the use of the whistle wasn't recommended as a standard, standby attitude indicator, is inadequate. They should have elaborated on exactly why this procedure is unsatisfactory to preclude the possibility of a man killing himself and not understanding why.

Hanging an object for attitude reference can be fairly reliable if – and this is a very important if – the number of G on the aircraft remains in the vicinity of one. The more positive G that the aircraft pulls, the more unreliable the "attitude indicator" will become in a turn. The most graphic illustration is an aircraft pulling sufficient G in a 90 degree bank. The hanging object will now be parallel with the horizon giving the pilot a wings level indication. Enough said.

LT J. W. Stella, USNR

See next letter.

*Beaufort, S.C.* – The narrator of (and your comment on) the article, "Airspeed, Vertical Speed Indicator, Whistle," in the August issue left the impression that the whistle served as a crude attitude indicator. If Whistlemouse did believe that, he is luckier than he thinks.

The whistle actually served as nothing more than a large balance ball and anyone relying on it for wing attitude information could quite easily split-S (balanced flight and positive-G) or spiral his way into the ground. Remember how the graveyard spiral was invented?

For wing attitude in partial panel work you must have some sort of heading indicator as the turn needle or, in extreme circumstances, maybe the wet compass.

CAPT M. F. Faulkner, USMC

**• We, too, regard Whistlemouse as having been extremely lucky in successfully penetrating the undercast using "Airspeed, Vertical Speed Indicator and Whistle." Hence, our editorial "Whew!" To elaborate on this, a hanging object (such as a whistle) most certainly cannot be regarded as a reliable indicator of wing position (attitude). For one thing, when the aircraft is in balanced flight with sufficient positive-G, the whistle will hang vertically (from the pilot's viewpoint) even though the aircraft may be in a bank and turning (due to centrifugal force). Thus, in this case, it would be useless as an indicator of true attitude. It is also easy to imagine how utterly useless it would be in negative G flight. Whistlemouse indicated in his narrative that he did have a wet compass but made no mention of using it for determining attitude. As Captain Faulkner suggests, the wet compass could be useful to some extent as an indirect indicator of wing position.**

**To sum up, instrument flight in jet aircraft using partial panel procedures is considered an emergency. This situation is bad enough but if a pilot also loses his turn indicator, the odds against successful instrument flight go out of sight.**

**To insure that no one is misled, we'd like to repeat Captain Faulkner's observation that anyone relying on a whistle for attitude information "could quite easily split-S (balanced flight and positive-G) or spiral into the ground." Therefore, not only is the whistle not recommended as an attitude indicator, it must also be stressed that its use could lead to disaster.**

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

## FOD God

*NAS Saufley Field, Fla.* – Some men here in the Quality Assurance division of VT-1 have created a monster. Standing six feet tall, with flashing red eyes and wearing a nomex flight suit, he devours anything that might be classified as capable of causing FOD and promptly displays the latest examples through his plexiglas stomach. Who is this creature? Is it a reincarnated Dracula or Frankenstein's monster? No, he's the FOD god of VT-1 and has become a "living" symbol of the squadron's FOD control program.

The idea for a FOD god was dreamed up by AMS1 Ramon, who was ably assisted by ADR1 Rowles and ADRC Myers in its construction. According to AMS1 Ramon, his idea was to animate the concept of FOD control and present a display in a manner to cause everyone in the squadron to take notice. Every aviation activity is concerned with the FOD problem. Any idea or gimmick which can involve a majority of personnel in the FOD control effort will do more to bring about a reduction in FOD than any reprimand will for inadvertently leaving a tool or other like item in an unauthorized location aboard an aircraft. FOD control begins as an individual effort, while the mission of the FOD god is to expand this individual awareness to everyone in the activity.

Standing tall in the hangar, his belly lined with tools, safety wire, pencils and other items found in the VT-1 operating areas during the past month, Ramon's


From left to right ADR1 ROWLES, VT-1's FOD god, AMS1 RAMON and ADRC MYERS.

monster beckons to every maintenanceman and pilot to take a good second look at his past performance and contemplate what his future resolutions should be about FOD control. "Like any safety program," says Ramon, "FOD control is only as effective as the effort and support it receives from the men. The FOD god stands as a constant reminder to each man that he must do his part to eliminate FOD." Looking at the beast, one gets the eerie feeling that any man who fails to do his part might find a huge, hungry creature angrily confronting him on the hangar deck some dark and dreary night.

We hope that this letter and photo will prompt other aviation activities to construct and erect a double of our FOD god within their own operating spaces.

LTJG K. N. Cunningham, USN
VT-1 PAO

**• An "Attaboy" to AMS1 Ramon and his two assistants with his FOD god project. The idea for a FOD god has much merit and should strike a receptive chord in more than one activity.**

**Editor's Note:**

A CONSIDERABLE amount of correspondence has been directed to Naval Safety Center concerning the cover on the January issue of ALL HANDS. It is gratifying to note the attention being paid to the wearing of proper flight gear as it applies to the pilot of the helo featured on this cover. It is, however, equally disturbing to learn that many fleet types apparently think that the publishing of ALL HANDS (a BUPERS Career Publication) is a function of NAVSAFECEN. This is not the case. APPROACH, MECH and FATHOM are the *only* safety review magazines from the Safety Center. The news editor of ALL HANDS agrees that, while the cover art is colorful and eye-catching, it is definitely not a testimonial to what the well-dressed naval aviator should be wearing when he goes a flyin'!

## Visor Save

*FPO, New York* – Enclosed is a photo illustrating once again the value of keeping your helmet visor down while in flight. Both the visor and visor cover were cracked after an F-8 canopy shattered. Because his visor was down the pilot escaped without a single cut or scratch. A piece of the shattered canopy is shown at the left. (See arrow)

LT Mardis M. Coers
Aviation Safety Officer,
VC-8

**• One more instance in which personal protective equipment worn properly does its job!**

Vol. 16 **approach** No. 9

RADM W. N. Leonard
Commander, Naval Safety Center

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

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### Departments



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### Credits

The loneliness of the long distance flyer is typified by the constant vigilance of the P-3 on station. Cover painting by Blake Rader.

NavAir 00-75-510

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**Subscriptions:** Single copy 55 cents; 1-year subscriptions $6.00; $1.50 additional annually for foreign mailing.

**Printing:** Issuance of this periodical approved in accordance with Department of the Navy Publications and Printing Regulations, NAVEXOS P-35. Library of Congress Catalog No. 57 60020.

# ONE ROBIN DOES NOT MAKE A SPRING, BUT...

IN JANUARY 1970, most naval aviation activities observed a short safety standdown prior to resuming flight operations after the holidays. During this standdown, aviation operations were examined closely at the unit level in an effort to anticipate problems and increase safety of operations during coming months. Thereafter, the accident rate for January 1970 fell to .94 – one of the lowest (if not the lowest) monthly accident rates in history.

During January 1971, the safety standdown was repeated. Preliminary statistics show that the monthly rate for January 1971 was .95. This is very encouraging. However – just as one robin does not make a spring, neither does one or two sets of monthly statistics prove that standdowns are a panacea. Nevertheless, the evidence is mounting that naval aviation as a whole can do much to prevent accidents by approaching the problem in a forceful, direct manner.

Now is the time to capitalize on this trend. Let's apply our best efforts to the problem during future months by pursuing a thoughtful, dynamic and direct program of action.

# FLYING
## with a cold is poor
# HEADWORK.

Don't.